

BROKERAGE FUNCTIONS IN NETWORK LEVEL INNOVATION PROCESSES

Key words: broker, distance, innovation, network

Satu Parjanen¹

Lappeenranta University of Technology, Lahti School of Innovation
satu.parjanen@lut.fi

Mirva Hyypiä

Lappeenranta University of Technology, Lahti School of Innovation
mirva.hyypia@lut.fi

Tuija Oikarinen

Lappeenranta University of Technology, Lahti School of Innovation
tuija.oikarinen@lut.fi

Abstract:

In this study, the focus is set on investigating the concepts of distances and proximities and brokerage functions in the context of network level innovation process. The research problem is: how can network's innovativeness be skilfully enhanced by brokerage functions and how brokers use different kind of distances to reveal the innovation potential in structural holes. The theoretical discussion provides the background for why the brokerage activities are considered as an essential component of innovation activities. The empirical data used in this study is from a participatory action research based development project which aims at fostering collaboration between case company and its customers and members of distribution channels.

¹ Corresponding author: Satu Parjanen, Lappeenranta University of Technology, Lahti School of Innovation, Saimaankatu 11, FI-15410 Lahti, Finland, GSM +358 40 077 9894, fax +358 3 876 9133, email satu.parjanen@lut.fi

1. INTRODUCTION

Innovations are widely seen as the driving force of economic growth and competitiveness. Organisation's success and survival depend on their capability to create new knowledge and then innovation. In order to foster innovation and to strengthen competitiveness it becomes important to integrate different knowledge, competences and experiences in a cooperative perspective. Networks can be considered as sources increasing organisation's innovative capabilities (Reagans & McEvily, 2003). Participation in networks can facilitate processes of learning and innovation amongst organisations through the sharing of resources, knowledge, and capabilities within an uncertain economic environment (Mackinnon, Chapman & Cumbers, 2004).

Network perspective on innovation emphasis on the importance for innovation of connectivity of the heterogeneous group of actors and the importance of exploring and exploiting weak ties (Granovetter, 1973) and structural holes (Burt, 1992). According to Burt (2004) innovations are most likely found in the structural holes because of the heterogeneity of knowledge. Based on this, diversity or distance between innovating partners can be considered as a source of innovation. This distance can take different forms: cognitive, communicative, organisational, social, cultural, functional, or geographical (Harmaakorpi, Tura, & Artima, 2006) and temporal distance (Parjanen, Melkas & Uotila, forthcoming). These distances between innovating partners may also be so great that a special interpretation function is needed – information brokerage in the structural hole (as called by Burt 1997). Burt (2004) suggested that brokers focus on establishing ties to other disparate or disconnected groups, so they can then bring together members of the two groups who would otherwise be more difficult to connect. Brokers support innovation by connecting, recombining and transferring to new contexts pools of ideas that would otherwise be disconnected (Verona, Prandelli & Sawhney, 2006).

This study focuses on investigating the concepts of distances and proximities and brokerage functions in the context of network level innovation process. The main research question to be answered is: how can network's innovativeness be skillfully enhanced by brokerage functions and how brokers use different kind of distances to reveal the innovation potential in structural holes. The study contains both a theoretical discussion and a case description on brokerage efforts in a network level innovation process. The empirical data used in this study is from a participatory action research based development project which aims at fostering collaboration between case company and its customers and members of distribution channels. Organising a session called InnoDay was a core intervention in facilitating the development of a distribution-channel network to an innovative value-adding network. The idea was to create discursive practices among interconnected communities of practice and facilitate them to develop the practices in which they interact in their daily work life (Gherardi & Nicolini, 2002).

2. BROKERAGE FUNCTIONS IN FACILITATING NETWORK LEVEL INNOVATION

In linking networks and innovations, the heterogeneity of resources and resource mobilisation are essential. Heterogeneity of resources means that knowledge and learning become important. (Oerlemans, Meeus & Boekema, 2001.) Networks themselves do not provide competitive advantage, it is more how the company builds and uses them that matters (Huston & Sakkab, 2006).

Most innovations happen at boundaries between disciplines or specializations (Johansson, 2004). This means that working across boundaries or distances is key ingredient in innovation. This also explains why these distances could be considered as a source and a barrier to innovation. For example the centres of creativity needed in innovation tend to be at the intersections of different domains, where beliefs, lifestyles and knowledge mingle and allow individuals to see a new combination of ideas with greater ease (Csikszentmihalyi, 1996). But people tend to be attracted to groups made up of members similar in some way to themselves and relatively few people are capable of bonding different groups together. Behaviour and opinion are usually more homogenous within than between groups, so people connected across groups are more familiar with alternative ways of thinking and behaving (Burt, 2004).

The term structural hole refers to the social gap between two groups. Structural holes often are the weak connections between clusters of densely connected individuals (Granovetter, 1973; 2005). Networks with an abundance of structural holes create opportunities for the new combination and recombination of ideas. According to Burt (2004), structural holes lead to good ideas. People surrounding structural holes have different interests, perspectives and use different concepts and language. Success in innovation is seen as depending upon the flexibility of the organisation, and the ability to interact with outside organisations and third parties. (Gellynck, Vermeire, & Viaene, 2007.)

Partners participating in networked innovation processes on different sides of structural holes have different knowledge interests. They also have information of different quality and achieved for their own purposes (Melkas & Harmaakorpi, 2008). The difference between partners is often so great that a special interpretation function is needed. In the literature a great number of functions are attributed to innovation brokers like articulating innovation needs and corresponding demands in terms of technology, knowledge, funding and policy, network formation meaning facilitating the linkages between relevant actors and innovation process management like enhancing alignment and learning of the multi-actor network (Van Lente, Hekkert, Smits & Van Waveren, 2003).

Burt (2004) suggested that brokers focus on establishing ties to other disparate or disconnected groups, exploiting the structural hole, so they can then bring together members of the two groups who would otherwise be more difficult to connect. People on either side of the structural hole have access to different flows of knowledge (Hargadon & Sutton, 1997). Brokers support innovation by connecting, recombining and transferring to new contexts pools of ideas that would otherwise be disconnected (Verona, Prandelli & Sawhney, 2006). Multiple relationships, especially with individuals holding broker positions within these networks are perceived to be important to innovative behaviour (Shaw, 1998). Whilst spontaneous cooperation

between organisations can occur, it appears that a brokerage intervention can help cooperation, for example, by advising on the advantages of cooperation, giving information, identifying opportunities, catalysing discussions between different actors or bringing firms together.

3. DISTANCES AND PROXIMITIES AS SOURCES OF INNOVATION

The concepts of proximity and distance are used in many different ways in literature dealing with, for example, innovation studies, organisational science and regional science (Knoben & Oerlemans, 2006). The literature usually emphasises advantages of proximity. Proximity is seen as an important precondition for knowledge sharing, knowledge transfer and technology acquisition (Gertler, 1995). The different dimensions of proximity reduce uncertainty, solve problems of coordination and facilitate interactive learning and innovation. Proximity may however also have negative impacts due to the problem of lock-in – meaning lack of openness and flexibility (Boschma, 2005). Innovations thus need also elements of distance. Eight dimensions of distance (and proximity) are presented below: cognitive, communicative, organisational, functional, cultural, social, geographical (Harmaakorpi, Tura & Artima, 2006.) and temporal (Parjanen, Melkas & Uotila, forthcoming.) In practice, drawing the lines between the different dimensions may be very difficult, but identifying and discussing them is useful both in theoretical and practical sense.

3.1 Cognitive Distance

Innovation researchers are unanimous about the fact that there is a lot of innovation potential in the combination of different fields of knowledge (e.g., Johansson, 2004; Pekkarinen & Harmaakorpi, 2006). Knowledge building and innovation often require dissimilar, complementary bodies of knowledge. Cognitive diversity will increase the likelihood that creative new knowledge emerges. Through the interaction of diverse knowledge groups, there is the potential to overcome the factors constraining the development of new knowledge. (Mitchell & Nicholas, 2006, p. 69.)

Two actors can be cognitively distant for two main reasons: (i) they know different topics, or (ii) they have a different level of knowledge depth on the same topic (Albino, Carbonara & Petruzzelli, 2007). Too little of cognitive distance means lack of sources of novelty, while too much cognitive distance implies problems in communication (Nooteboom et al., 2007). In order to transfer new knowledge effectively, actors need to have at least partly similar, but not necessarily identical frames of knowledge. Cognitively close individuals are able to assume certain common knowledge that does not have to be defined. Cognitive proximity facilitates effective communication, and people sharing the same knowledge base and expertise may learn from each other, but too much cognitive proximity may be detrimental to innovation. It increases, for example, the risk of cognitive lock-in; routines within organisations or between organisations obscure seeing of new possibilities. (Boschma, 2005.)

3.2 Communicative Distance

An ability to communicate and exchange ideas is an important part of innovation processes. The term interaction is used to describe the use of language and other symbols to develop an enriched and shared understanding. Communication can easily be misunderstood or misinterpreted. People often discuss problems in a language (or manner) that they mistakenly assume everybody in the group to understand. They use, for example, various concepts that are not understood by everybody or the concepts may have different meanings in different areas of expertise.

The innovation partners' success in reaching a common vision, exchanging creative ideas and evaluating them depends on the ability to devise a shared language, which is an essential asset in developing a common understanding. Sharing of a common language facilitates people's ability to "gain access" to other people and the information that they possess. In order to combine the information gained through social interaction, the different parties must have some overlap in knowledge (Nahapiet & Ghosal, 1998, p. 254) or there must be someone who interprets this knowledge so that it is relevant to the others.

3.3 Organisational Distance

The development of emergent knowledge is vital for innovation, but sharing, exchanging, integrating and creating knowledge can be difficult. Knowledge creation depends also on a capacity to coordinate the exchange of complementary pieces of knowledge within the organisation and between organisations. Organisational distance or proximity is defined as the extent to which relations are shared in organisational arrangements. This involves the rate of autonomy and the degree of control that can be exerted in organisational arrangements. Organisational distance refers to the difficulty in coordinating transactions and exchanging information within and between organisations. Low organisational proximity or distance means that between independent actors there are no ties and there is no possibility for interactive learning. If organisational proximity is high like in a hierarchically organised firm or network there are only strong ties between actors. (Boschma, 2005.)

Organisational proximity is believed to be beneficial for innovations, because new knowledge creation goes along with uncertainty and opportunism. To reduce these, strong control mechanisms are required and hierarchical organisation or tight relationships within the organisation can provide solutions to these problems. Too much of organisational proximity is however accompanied by lack of flexibility. There is a risk of being locked-in in specific exchange relations. Search for novelty often requires going out of the established channels. (Boschma, 2005).

3.4 Functional Distance

Functional distance refers to actors' different areas of expertise. Members in different functional communities do not necessarily understand each other because they do not interpret knowledge in the same contexts. Functionally close actors act in the areas of expertise close to each other, for example in the same industry (Harmaakorpi, Tura & Artima, 2006). Similarities in knowledge and experiences facilitate the acquisition and development of new knowledge.

The importance of functional proximity is based on the concept of absorptive capacity. It means an organisation's ability to recognise the value of new, external knowledge, and to assimilate and apply it (Cohen & Levinthal, 1990). If actors are functionally far from each other, there is more to learn and greater possibilities for innovations, but the distance also means that it is more difficult to learn. The concept of functional proximity seems similar to cognitive proximity, but the latter is a much broader concept that refers to the extent to which actors can communicate efficiently, whereas functional proximity refers to the extent to which actors can actually learn from each other: what they exchange and the potential value of these exchanges. (Cf. Knobens & Oerlemans, 2006.)

3.5 Social Distance

Economic relations are to some extent always embedded in social contexts, and social ties or relations in turn affect economic outcomes (Boschma, 2005; Granovetter, 2005). Social proximity may facilitate the exchange of tacit knowledge, in particular, because of trust-based relations. Lack of trust can prevent people from asking questions or volunteering in giving information. The potential for increased competition is another reason for people to avoid sharing what they know. On the other hand, too little social distance in an economic relationship may weaken the innovative capacity of organisations due to an overload of trust. Closed network systems may incur opportunity costs because outsiders with new ideas and knowledge are denied entry. Long-term relations or relations with too much commitment may lock members of social networks into established ways of doing things at the expense of their own innovative and learning capacity. (Boschma, 2005.) While organisational and functional distances are connected purely to the relations between institutions, social distance is fundamentally about the relations between people. It refers to the intensity of the trust-based social relations, such as friendship or kinship. The notion of social proximity comes close to the concept of social capital as defined, for example, by Tura and Harmaakorpi (2005) and Burt (2005).

3.6 Cultural Distance

How organisations view knowledge sharing and creation seems to be dependent on their organisational culture. Every organisation and even its subunits have a culture of their

own, which influences the ways in which its members think, feel and act. Cultural distance refers to differences in these cultural habits, rules and values. The creation of knowledge is therefore a complex process involving the understanding of different organisational cultures and subcultures (Beckhy, 2003). Cultural assumptions, beliefs and values can be deep-rooted within the members of the organisation, and they cannot be changed easily.

When organisational cultures are similar, organisations are expected to interact more easily and with better results, because common interpretations and routines allow organisations to interpret and give meaning to actions without making all these interpretations explicit (Knoben & Oerlemans, 2006). Cooperation will develop more easily between members of the same organisation or innovation network. (Rallet & Torre, 2005.) The challenge in innovation activities is to get members of different organisational cultures to interact with each other.

3.7 Geographical distance

Geographical distance refers to the spatial or physical distance between economic actors (Boschma, 2005). The distance is also relative to the means of transport or the perception of these distances by actors (Rallet & Torre, 2005). Short distances bring people together. They facilitate face-to-face interactions and therefore foster knowledge transfer and innovation. Especially the transfer of tacit forms of knowledge is easier when the distance is small. (Knoben & Oerlemans, 2006; Boschma, 2005.) The geographical proximity is most likely to stimulate social proximity, because short geographical distance favours social interaction and trust building (Boschma, 2005).

Although proximity facilitates interaction and cooperation, it does not automatically produce innovations. Geographically proximate actors may be cognitively too distant to cooperate. The geographical proximity does not necessarily mean that people are aware of one another or that they are in contact with each other or know what the other person is doing. Other forms of proximity may act as substitutes for geographical proximity. For example, organisational proximity enables coordination over long distances (Rallet & Torre, 1999; 2005).

3.8 Temporal distance

Temporal distance refers to differences in the ability to imagine potential futures and make use of future-oriented information and knowledge generated in, for example, foresight activities. This temporal distance manifests itself in the ways in which actors perceive the future – in a reactive or proactive manner.

4. CASE STUDY

4.1 Methods

The empirical data used in this study is from a participatory action research based development project, which aims at revealing the hidden and unspoken obstacles of collaboration through the different levels of an organisation. The case company is a big Finnish industrial company. In 2008-2009 brokers organized altogether, in close co-operation with the company's management, 9 sessions for employees of the company to bring together alternative worldviews, practices and ideas. Over 100 of the company's workers participated in the sessions.

In autumn 2009 brokers continued the research and development project with the case company by extending the efforts to foster collaboration with their customers and members of distribution channels. The trigger for enlarging the project was that the management of the case company was convinced of unused innovation potential in the network. They described the current situation as market-based negotiations where the product was bought and sold many times before reaching the consumer. Information about consumer needs and the needs of intermediating organisations had many stopping points to pass before reaching the other end of the distribution channel. The management of case company assumed they could together figure out totally new ways to do business together if only they had opportunities for collective co-creation.

Organising a session called InnoDay was a core intervention in facilitating the development of a distribution-channel network to an innovative value-adding network. The data consists of the observation of the session. During the session all brokers made notes and the whole session was videotaped. The data was first analysed by the researcher who did not participate in the InnoDay. The first stage of the analysis concentrated on the identification of the different kinds of distances during the InnoDay. During the second stage of the analysis, the researcher tried to deepen the analysis by identifying the ways the brokers acted in order to bridge these distances. After that the researchers who participated as brokers in InnoDay commented and clarified the analysis.

4.2 Analysis: InnoDay session

The InnoDay session was organised by brokers in close co-operation with the management and key persons of the case company. Prior to that session, brokers had several face-to-face and virtual meetings not only with the personnel of the case company but also with the personnel of the client company and other organisations in the network. The purpose of these meetings was to reduce the social distance between the participants and the brokers. It should be noticed that the social distance between the representatives of the case company and most of the brokers was reduced already during the previous phases of the project. These meetings also gave information about how to construct the InnoDay. During the meetings the theme of the InnoDay was formulated and the structure and working methods of the InnoDay were chosen. The preparatory phase made it possible also to commit the key participants of the InnoDay better to the process.

The virtual meetings and survey conducted by brokers made it possible to reduce geographical distances between participants. The survey was conducted via the internet

of all the potential participants of the day to map their expectations for the session and to find out their attitudes and priorities for development needs. A total of 26 questionnaires were delivered, and 22 were returned. The response rate was therefore 85 %. The respondents represented four companies. According to the survey, the strengths in current co-operation were the motivated and professional personnel with good inter-personal relations and well functioning routines. This kind of organisational proximity may also have disadvantages. Too much of organisational proximity is accompanied by a lack of flexibility. There is a risk that of being locked-in in specific exchange relations and it may limit access to various sources of information (Boschma, 2005). In this kind of situation brokers have to courage the participants to figure also alternative ways to handle common challenges. This is not necessarily easy task because usually when the companies or networks are locked into a culture that has proven itself to be successful in the past, it will be difficult to convince its members to adopt alternative ways of doing things (Tan, 1998).

Respondents were interested in reducing the temporal distance in their innovation activities meaning chancing their activities to more proactive manner. The respondents mentioned, as the most potential future development targets, the widening and deepening of network level co-operation so that more partners participate and that cooperation is not only about current business operations but more a pro-active idea generation. The respondents described ideal innovation practices to be continuous, open, enjoyable, free-and-easy, fruitful, inspiring, target-oriented, regular, informal and easy to commit for everyone, including the management.

The survey helped the brokers and the representative of the case company to clarify the theme of the InnoDay session. The main working question of the day was ‘How we create superior co-operation practices which enable us to produce continuously innovative solutions to our customers?’ and the sub-questions were:

- Who we need as partners? Why, what kind of value they add?
- How we can commit them to co-operation? What are the interests of organisations? What are the motives of individuals?
- What kind of practices we need? How, where and when we need to interact?
- What kind of leadership we need?

There were 30 participants in InnoDay (Table 1). The case company was represented by 12 persons and the customers by 9. In addition to those buyer-seller pairs who encountered regularly, there were also representatives from product- and packaging design and managers. The other members of the network who participated in the session were a wholesaler, a media agency and a consumer research company. In addition, there was also one representative of another customer organisation operating in another industry field and 5 brokers from the University. The purpose of the heterogeneity of the participants was to use the innovation potential of cognitive distance. Cognitive distance tends to increase the potential for innovation. For example, cross-disciplinary groups of individuals may offer application expertise in a variety of areas. This enhances learning opportunities and fresh thinking, and promotes integration across traditional borders.

Table 1. Background information of participants in the InnoDay

	Representative	Organisation	Role in the InnoDay Session
1	Senior Vice President	Case Company	Key personnel

2	Vice President	Case Company	Key Personnel
3	Sales and Marketing Director	Case Company	Key Personnel
4	Product and Sales Manager	Case Company	Management level
5	Area Sales Manager	Case Company	Management level
6	Key Account Manager	Case Company	Management level
7	Package Development Manager	Case Company	Management level
8	Sales Engineer	Case Company	Employee level
9	Sales Assistant	Case Company	Employee level
10	Marketing Assistant	Case Company	Employee level
11	Graphic Designer	Case Company	Employee level
12	Industrial Designer	Case Company	Employee level
13	Managing Director	Customer C.	Key personnel
14	Sales Director	Customer C.	Key personnel
15	Brand Manager	Customer C.	Management level
16	Package Development Manager	Customer C.	Management level
17	Lead Buyer	Customer C.	Employee level
18	Brand Coordinator	Customer C.	Employee level
19	Industrial Designer	Customer C.	Employee level
20	Package Process Developer	Customer C.	Employee level
21	Sales Promoter	Customer C.	Employee level
22	Project Manager	Wholesaler	Management level
23	Managing Director	Customer Research C.	Key Personnel
24	Managing Director	Media Agency	Key Personnel
25	Design Manager	Another Customer C.	Management level
26	Professor in innovation systems	University	Broker
27	Researcher	University	Broker
28	Researcher	University	Broker
29	Researcher	University	Broker
30	Project coordinator	University	Broker

The structure of the InnoDay is described in Table 2. InnoDay began with introduction to the theme. The main facilitator explained the challenge of the session and working methods. To help the participants to orient their thinking to the theme of the session the summary of the survey was presented. During the presentation participants were able to comment and discuss about the results. That way they had possibility get familiar with others thinking and expertise.

The goal of identifying opportunities and generating ideas is to become completely open to all possible alternatives. This goal is virtually impossible to meet because people put up barriers when socialising. To lighten the atmosphere and reduce possible social distances the session continued with a warm-up exercise. Social cohesion around a relationship can ease knowledge transfer by decreasing the competitive and motivational impediments. When individuals believe in freedom of expression and appreciate diverse viewpoints, they engage in behaviour that is more effective in creating knowledge (Mitchell & Nicholas, 2006, p. 71).

To build as heterogeneous groups as possible the groups were composed during the warm-up exercise. If participants would have composed the groups by themselves they probably would have been too homogenous because people tend to be attracted to groups made up of members similar in some way to themselves. If group selection would have favoured those who are similar it would have reduced the diversity of members. Homogenous groups often reach solutions quicker and with less friction along the way and do little to enhance expertise and creative thinking. Everyone comes to the table with the similar mind-set and leaves with the same. (Amabile, 1998.)

Behaviour and opinion are usually more homogenous within than between groups, so people connected across groups are more familiar with alternative ways of thinking and behaving. (Burt, 2004).

The challenge of the day was approached from different perspectives. Theoretical frameworks, customers' needs, retailers' priorities and logistic considerations were presented as well as the viewpoints of the producer and package provider. Theoretical framework concerned how it is possible to apply innovation approach to current business operations. Professor of innovation systems introduced the principals of practice-based innovation. An illustration from another field was also demonstrated to use functional distance as a possible source of innovation. The introductions were short and in between there were different kinds of brainstorming and facilitated discussions to cultivate the contents of introductions to their network practices.

The session was facilitated by the brokers. One of the brokers was the main facilitator of the session. She explained the general working principals and what is going to happen next. In her talk she motivated and encouraged the participants. She asked many times that does everybody have understanding or is there anything to clarify. Other brokers acted as group facilitators. The role of the broker is to keep the group on track and make sure that they do not deviate from their assigned goals. In group work brokers' task were listening, clarifying, questioning, summarizing, observing and giving feedback. In that way brokers reduced possible cognitive, communicative or social distances. Flexibility, sense of humour and positive feedback are good aid in creating relaxed atmosphere where conversation is easy. During the session brokers were smiling and laughing a lot. The broker is essentially a neutral person who supports the group throughout. By maintaining an objective stance and honouring the wisdom and skills of the group she or he can encourage the participants to work well. Brokers listened very carefully and were interested what the participants were saying. They showed their interest by knocking their head or by asking further questions.

Some people are simply more creative than others (Woodman, Sawyer & Griffin, 1993) but creativity can be stimulated and enhanced, for example, with various creativity methods. To enhance the idea generation the brokers had chosen different kind of creativity methods for example e.g. drama techniques, game-like environment and playfulness. For example the participants actually composed game boards with seafaring theme in groups. They were as a mixed team on the same boat. They had to think who is on the boat, what kind of crew is needed in this boat trip. They were assigned to think what they are aiming at, what is in their dream island. Then they had to think what kind of reef could come to their way, and what kind of wind gives their cause a boost. A ready-made game board was not used, so that the participants could situate themselves in the game, and by creating a shared game board, they were actually rehearsing mutual decision-making. These kinds of methods help to use the distances as a potential for new ideas but at the same time to reduce for example social distances between participants.

The participants worked in mixed groups, though the key personnel had a group of their own. This enabled that numerous various aspects were dealt with in the conversations. The exposure to ideas from other group members and the use of creative methods may be at least as important in creative idea generation (Couger, Higgings & McIntyre, 1993). Thus the significant benefit of sharing ideas with others is that it should increase the chance that one will come across ideas one would not have thought of in a solitary idea-generating session. These ideas may in turn stimulate additional novel ideas. (Paulus, 2000.)

In the afternoon the participants continued working in three workshops. The first workshop concentrated on customers' point of view, the second on physical product characteristics and the third on co-operation practices in the network. The participants' success in reaching a common creative vision, exchanging creative ideas and evaluating them depends on the ability of the group to devise a shared language, which is an essential asset in developing a common understanding. The workshops the communicative distance was reduced by for example real-life photos and product prototypes. After the workshops, the participants crystallized the suggestions that should be done to create superior cooperation practices which would enable them to produce continuously innovative solutions to their customers.

Table 2 The structure of the InnoDay

The phase of the session	What happened	Distance	Brokers' technique	Observation what brokers did
Opening the day	Reason for the session	To reduce social distance	Presentation	Motivate the participants
Orientation	Results of the survey and the aim of the day	To use and reduce cognitive distance	Conversational presentation	Commit the participants to the shared aim
Warm-up	Composing of groups	To reduce social distance	Role play	Become acquainted with each other
Theoretical introduction	Explain the innovation approach	To use cognitive distance	Individual ideation after introduction	Apply innovation approach to current business operations and own daily work
End users' point of view	Different end user categories and preferences	To use functional distance	Presentation, videos and association technique	Activate participants to generate ideas from end user's view point
Illustration from another business field	Example of doing things in new collaborative ways	To use functional distance	After presentation ideation in pairs	Open new perspectives and alternative ways of co-operation
Customer's future scenarios	Demands for the product in the future	To reduce cognitive distance	Idea rotation after presentation	Explain the demands for continuous innovation
Priorities of the distribution channel	Demands of logistic and retail	To use cognitive distance To reduce communicative distance	Presentation, photos and group discussion	Represent the needs and priorities in distribution channel
Product innovations	Examples of new product innovations	To use cognitive distance To reduce communicative distance	Presentation and open discussions	Open new market possibilities
Pause				
Workshop: customers' point of view	Real-life photos of products life-span	To reduce communicative distance	Categorization of demands	The whole life span and demands for the product

Workshop: physical product characteristics	Product prototypes to be handled	To reduce communicative distance	Handling of products	Demonstrate the multiple demands for the product
Workshop: cooperation practices in the network	Describing current product development process	To reduce communicative distance	Composing a board	Illustrate the problems and blackouts in current process
Summary	Round-up the group's suggestions for future acts	To reduce temporal distance	Alternative methods: process description, fish bone, SWOT, execution chart	Commit participants to continue development work
Conclusion	Crystallize outcomes of the day	To reduce social distance To reduce temporal distance	Open discussion	Create shared understanding and orientation for development of network level cooperation

The outcome of InnoDay was a common understanding of development needs in the network co-operation. The practices for continuous development in the network level needs to be developed into more systematic processes and routines than it currently is. The feedback channels, responsibilities and interaction forums are to be tuned. This indicates to reducing organisational distances between companies. During InnoDay a project with an aim, timetable, follow-up, assessment and persons in charge was launched to develop these practices. Collaboration practices in the network level for new product development are needed occasionally. During InnoDay the decision was made to clarify the process and responsibilities for those which were nominated. Innovation creation practices indicated to reducing the temporal distance. The need to create collaborative practices for innovation in a value-adding network was noticed during InnoDay. Creation of these practices was considered quite challenging. The participants of InnoDay suspected their own abilities to create them along with their daily work. They assumed that totally new ways to gain, share and integrate knowledge were needed to be able to be more proactive.

5. CONCLUSION

Open innovation demand a higher involvement of external actors in an innovation process. Successful innovation under complexity and uncertainly can be achieved through collaborative approaches that uses the distances as sources of ideas and innovation. This study underlines the importance of brokerage functions in network level innovation process. According to the experiences of this study the brokerage function includes spanning the structural holes and bridging different innovating partners. Spanning a structural hole is clearly a process rather than an individual action. It is highly improbable that the innovating partners "find" each other in one day without careful preparation and well-prepared script.

Theories of innovation suggest that there is potential for innovation in the structural

holes of the innovation system because of the heterogeneous of resources. Constructing the InnoDay brokers facilitated the use heterogeneous of participants' knowledge as a possible source of innovation. It should be noticed that brokers themselves were not experts in the theme of the InnoDay. Their knowledge and skills were more related to the management and facilitation of the InnoDay process. This includes for example selecting the participants so that there is cognitive distance between them. That way it is possible to examine an issue from an alternative viewpoint. Cognitive distance also forces participants to think in broader terms and combine differing approaches in a unique way.

It is crucial to allow the necessary flow of information to take place but also to establish a trustworthy atmosphere, which helps different actors to overcome their reluctance to take a part in an innovation process. In that sense it is essential to reduce the social distance between participants. There is possible that the problem or challenge is approached in the session from several cognitive perspectives and there can even be cognitive dissonance between different points of view. If there is no trust in the group, divergent perspectives and ideas will not be shared. It can be first perceived as difficult to establish trust in a group where the members do not necessary know each other. The presence of brokers is important in this respect. Brokerage must be done in such a way that it establishes, nourishes and maintains a climate that is appropriate for the group to succeed.

Our study concentrated on the fuzzy front end of the innovation process in a network. We can also raise the question about how the brokerage functions differ during the innovation process. Distances may indeed be differently accentuated during the various stages of innovation processes, and this may change the character of brokerage. Future research should study whether brokerage belongs mainly to the fuzzy front end stage of an innovation process, or whether it is needed also in later stages. Particular challenges posed by different types of innovation processes, such as process, service and product innovation processes, should also be looked into in detail in order to obtain results clarifying brokerage functions. User-driven innovation also places many new demands for brokerage and should be included in future research directions.

References

Albino, V., Carbonara, N. and Petruzzelli, A. (2007), 'External Knowledge Sources and Proximity: towards a new geography of technology districts.' *Regional Studies Association International Conference: Regions in Focus*, 2-5th April 2007, Lisbon.

Amabile, T. (1998), 'How to Kill Creativity', *Harvard Business Review*, vol. 76 issue 5, pp. 76-87.

Bechky, B. (2003), 'Sharing Meaning across Occupational Communities: The Transformation of Understanding on a Production Floor', *Organization Science*, vol. 14 no. 3, pp. 312-330.

Boschma, R. (2005), 'Proximity and Innovation: A Critical Assessment', *Regional Studies*, vol. 39, no. 1, pp. 61-74.

- Burt, R. (1992), *Structural holes: The social structure of competition*, Harvard University Press, Boston.
- Burt, R. (1997), 'The contingent value of social capital', *Administrative Science Quarterly*, vol. 42, pp. 339–365.
- Burt, R. (2004), 'Structural holes and good ideas', *American Journal of Sociology*, vol. 110 no. 2, pp. 349–399.
- Csikzentmihalyi, M. (1996), *Creativity. Flow and the Psychology of Discovery and Inventio*, HarperCollins Publishers, New York.
- Cohen, W. and Levinthal, D. (1990), 'Absorptive Capacity: A New Perspective on Learning and Innovation', *Administrative Science Quarterly*, vol. 35, pp. 128–152.
- Couger, J.D., Higgings, L.F., and McIntyre, S.C., (1993), '(Un)structured creativity in information systems organizations', *Management Information Science Quarterly*, December, 375-397
- Gellynck, X., Vermeire, B and Viaene, J. (2007), 'Innovation in food firms: contribution of regional networks within the international business context', *Entrepreneurship & Regional Development*, 19, 209-226.
- Gertler, M. (1995), 'Being there': Proximity, Organization, and Culture in the Development and Adoption of Advanced Manufacturing Technologies', *Economic Geography*, vol. 71, pp. 1-26.
- Gherardi, S. and Nicolini, D. (2002), 'Learning in a constellation of interconnected practices: canon or dissonance?', *Journal of Management Studies*, vol. 39 no. 4, pp. 419-436.
- Granovetter, M. (1973), 'The Strength of Weak Ties', *American Journal of Sociology*, no. 78, pp. 1360–1380.
- Granovetter, M. (2005) "The Impact of Social Structure on Economic Outcomes", *Journal of Economic Perspectives*, vol. 19 no. 1, pp. 33–50.
- Hargadon, A. and Sutton, R.I. (1997) 'Technology brokering and innovation in a product development firm', *Administrative Science Quarterly*, vol. 42, pp. 718–749.
- Harmaakorpi, V., Tura, T. and Artima, E. (2006), '*Balancing Regional Innovation Policy between Proximity and Distance*', paper presented at the Fifth Proximity Congress, 28–30 June 2006, Bordeaux, France.
- Huston L. and Sakkab, N. (2006), 'Connect and Develop. Inside Procter & Gamble's New Model for Innovation', *Harvard Business Review*, vol. 84 issue 3, pp. 58-66.

- Johansson, F. (2004), *The Medici Effect: Breakthrough Insights at the Intersection of Ideas, Concepts and Cultures*, Harvard Business School Press, Boston.
- Knoben, J. and Oerlemans, L. (2006), 'Proximity and inter-organizational collaboration: A literature review', *International Journal of Management Reviews*, vol. 8 no. 2, pp. 71–89.
- MacKinnon, D., Chapman, K., & Cumbers, A. (2004), 'Networking, trust and embeddedness amongst SMEs in the Aberdeen oil complex', *Entrepreneurship and Regional Development*, vol. 16 no. 2, pp. 87- 106.
- Mitchell, R. and Nicholas, S. (2006), 'Knowledge Creation in Groups: The Value of Cognitive Diversity, Transactive Memory and Open-mindedness Norms', *Electronic Journal of Knowledge Management*, vol. 4 no. 1, pp. 67-74.
- Melkas, H. and Harmaakorpi, V. (2008), 'Data, information and knowledge in regional innovation networks: Quality considerations and brokerage functions', *European Journal of Innovation Management*, vol. 11 no. 1, pp. 103–124.
- Nahapiet, J. and Ghosal, S. (1998), 'Social Capital, Intellectual Capital and the Organizational Advantage', *Academy of Management Review*, vol. 23 no. 2, pp. 242–266.
- Nooteboom, B., Van Haverbeke, W., Duysters, G., Gilsing, V. and van den Oord, A. (2007), 'Optimal cognitive distance and absorptive capacity', *Research Policy*, vol. 36 no. 7, pp. 1016-1034.
- Oerlemans, L.A.G., Meeus M.T.H. and Boekema, F.W.M. (2001), *Innovation, Organisational and Spatial Embeddedness: An Exploration of Determinants and Effects*. Eindhoven Centre for Innovation Studies, Working Paper 01.03, Eindhoven University of Technology, The Netherlands.
- Parjanen, S., Melkas, H. and Uotila, T. (forthcoming), 'Distances, knowledge brokerage and absorptive capacity in enhancing regional innovativeness: A qualitative case study of Lahti region, Finland, *European Planning Studies* (ISSN 0965-4313).
- Paulus, P. (2000) 'Groups, teams and creativity: The creative potential of idea generating groups', *Applied Psychology: An International Review*, vol. 49, pp. 237-262.
- Pekkarinen, S. and Harmaakorpi, V. (2006), 'Building regional innovation networks: definition of age business core process in a regional innovation system', *Regional Studies*, vol. 40 no. 4, pp. 1-13.
- Tan, G. (1998), 'Managing Creativity in Organizations: a Total System Approach', *Creativity and Innovation Management*, vol. 7 no. 1, pp. 23–31.
- Tura, T. and Harmaakorpi, V. (2005), 'Social Capital in Building Regional Innovative Capability', *Regional Studies*, vol. 39 no. 8, pp. 1111-1125.

Shaw, E. (1998), 'Social networks: Their impact on the innovative behaviour of small service firms', *International Journal of Innovation Management*, vol. 2 no. 2, pp. 201-222.

Rallet, A. and Torre, A. (1999) "Is geographical proximity necessary in the innovation networks in the era of global economy?", *GeoJournal*, vol. 49, pp. 373-380.

Rallet, A. and A. Torre. (2005) "Proximity and Localization", *Regional Studies*, vol. 39, No. 1, pp. 47-59.

Reagans, R. and McEvily. B. (2003) 'Network structure and knowledge transfer: The effects of cohesion and range', *Administrative Science Quarterly*, vol. 48, no. 2, pp. 240-267.

Van Lente, H., Hekkert, M., Smits, R. and Van Waveren, B. (2003), 'Roles of systemic intermediaries in transition processes', *International Journal of Innovation Management*, vol. 7 no. 3, pp. 1-33.

Verona, G., Prandelli, E. and Sawhney, M. (2006), 'Innovation and Virtual Environments: Towards Virtual Knowledge Brokers', *Organization Studies*, vol. 27 no. 6, pp. 765-788.

Woodman, R. W., Sawyer, J. E., and Griffin, R. W. (1993), 'Toward a Theory of Organizational Creativity', *Academy of Management Review*, vol. 18, pp. 293-321.

Acknowledgements: The authors wish to thank the European Regional Development Fund and the Regional Council of Päijät-Häme for the opportunity of presenting their research at the conference for Organisational Learning, Knowledge and Capabilities.