Facilitating Innovation Scalability through Network Management

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Abstract

This is a single case study of a self-emerging network that from the beginning has strived to develop a scalable urban innovation in the fields of housing and living. Scalability in this context is transferring the innovation to another urban area after piloting, including the minor adjustments needed to fit the new area. We are interested in the networking process and the roles of network manager that enable both the networking process itself and the scalability of the innovation. We report the process through positive and negative critical incidents induced internally by the network manager or externally from outside the network. We emphasize the roles that facilitate networking although the case illustrates some negative roles as well. Furthermore, we state that the network manager's role can be positive in a certain phase of the networking phase and have a negative effect in another. A good example of this is the role of activist, which enables networking at the beginning of the process but can have a hindering effect during the actual networking.

The different roles a network manager can adopt and their differing influence on the networking process can be explained by the fact that networks are dynamic. Therefore, the systematic networking process and the network manager, though different roles should ensure that the network is both aware of its dynamic nature and able to respond to changes without losing the ability to concentrate on its core goal.   The end result of this study is a conceptualization of a network management process with the suggestions of the network management roles that during the process enable and ensure networking and scalability of innovation created.

Key Words
Innovation scalability, urban innovation, innovation management, network management, Innovation network

INTRODUCTION

This paper is a work-in-progress paper mapping the theories of innovation scalability and management of systematic networking. Systematic networking is the process of actions done by the actors in the network in order to achieve its goal including the managerial actions done to further this networking. This follows the definition of networking as something that all actors in a network do by suggesting, requesting, requiring, performing and adapting activities (Ford, Håkansson, Snehota and Gadde 2002). By stating that this networking is a systematic process we make a clear distinction to the abstract definition of networking referring to all social interaction.

We are studying networking and the network management of a network that is striving to create a scalable urban innovation. Urban innovations are of relevance as many of today's societal challenges are related to urban surroundings. Urban innovations are used, for example, when striving to find solutions to the development of sustainable districts. (Valovirta, Pelkonen, Kivisaari and Hyytinen 2011) The urban innovation in this case is a new type of housing solution, which combines a new innovational architectural solution, a new way of financing home acquisition and a service platform to support communality of the inhabitants. From the beginning the network has been creating an innovation that is scalable to different physical locations after being piloted in one area. Innovation scalability translates to introducing and deploying an innovation to several different markets, business fields, or physical locations after piloting it in one area (Valovirta et al 2011).

It is common for unexpected events to occur throughout the lifecycle of a project such as this (Söderholm, 2008). This study will focus on critical unexpected events (hereafter critical incidents), which Ahola (2009) among others considers to be events that significantly differ from standard routines. Bitner, Booms and Tetreault (1990) define critical incidents as interactions or incidents that are especially satisfying or dissatisfying. We follow the definition of Roos (2002), who defines critical incidents as incidents, which are perceived either as highly positive or negative. The case is presented by introducing negative and positive critical incidents that have had an impact on the networking process and its management. In particular we focus on the role of the network manager or facilitator as enabling or inhibiting the joint activities. In describing the case we are not looking into any single organization and their innovation capabilities, but are interested in the capabilities of a network to create an innovation and ensure the scalability of that innovation. Our research focus is on the link between network management, the network management roles, and innovation scalability of a network managed by a private organization.

THEORETICAL BACKGROUND

In the request for smarter cities, urban innovations are of importance and networks have been identified as an effective way to innovate (Håkansson 1987; Ritter and Gemünden 2003). The term innovation can refer to either the result of an innovation process or the process itself, but innovation management usually refers to the management of the innovation process from initial idea to market launch through development (Dreijer 2002). Innovation always includes commercialization/adaptation of a created product or service. Still, innovators are now striving for more, and they are looking for (urban) innovations that can be scaled to other physical places or different business fields. This goes beyond the traditional view of the management of an innovation process (for example Rothwell 1992) since the process does not end when the innovation is adapted or launched to a market, but is scaled by the network to other markets or fields as well. This phase of the innovation process corresponds to the fourth phase of systematic networking and network management, which we explain and illustrate later in the paper. Another aspect that links network management and innovation scalability is the fact that scalability is usually included in the design phase in urban innovations (Valovirta et al 2011), which in systematic networking responds to the first three phases of the process.

The research topics in network management research range from whether networks can be managed (Jarillo 1988; Möller, Rajala and Svahn 2003; 2005; Ford and Håkansson 2006; Järvensivu and Möller 2009) to what the needed capabilities of managing a network are (Möller et al 2005; Ritter and Gemünden 2003), what roles a network manager as can adopt as a facilitator or a mediator (Jyrämä and Äyväri 2007, Ståhle et al. 2004, von Korgh et al. 2000) and finally, which instance or who should manage the network (Agranoff and McGuire 2001; McGuire 2002; Mandell 2001; Meier and O'Toole 2005). Innovation management is its own theoretical discussion (Rothwell 1992; Dreijer, 2002; Dhanaraj and Parkhe, 2006).

According to the strategic network perspective a hub organization can take the initiative in developing and managing a network (Jarillo 1998; Ritter, Wilkinson and Johnston 2004; Möller et al 2005; Gulati, Nohria and Zaheer 2000). This is opposing to the view that organizations only can try to cope within a network (Turnbull, Ford and Cunningham 1996; Håkansson and Ford 2002; Ford and Håkansson 2006). According to innovation management research a hub organization can actively facilitate innovation processes integrating the processes of managing the innovation and managing the network (Nambisan and Sawhney 2011). In this paper we elaborate this idea and use a network management model that is designed to ensure successful creation of an innovation through the development processes of both the innovation and the network (Järvensivu, Nykänen, Rajala 2011).

Network management for systematic networking

The driver for creating networks and systematic networking is the actors' mutual understanding of the fact that working together is more effective than working outside a

network and delivers benefits to all actors (Nambisan and Sawhney 2011). A network can be formed by the actors (a self-organizing network) to work on a specific project for a certain purpose (Ford et al 2002). Such a network has certain resources and capabilities to gain the desired result, but alongside the networking process the resource and capability requirements may change, especially when scalability of the result, an innovation, is in question. Therefore, the evaluation of the composition of the network should be constant and new actors should be included in the network whenever needed disregarding the phase of the systematic networking process. (Järvensivu et al 2011)

The ability to identify and work with the proper players who deliver the right resources is an essential capability for a network manager. (McGuire 2002) Involvement of new actors or elimination of old ones change the network and may change the network picture of the actors, how they see the network and their position in it, since a network picture is the result of an actor's analysis and all the actions in the network (Ford et al 2002), which again are likely to change when new actors enter the network. Adding or removing an actor change the position of the actors and create new relationships, both of which are bases for the actors' network picture (Ford et al 2002). Ritter et al (2004) argue that an actor has different possibilities to manage or be managed by other actors in a network, and that it is the relationship or the network and not the actor that is the final influencer of the network. They therefore accentuate the importance of focusing on *managing the interactions with others* instead *of managing others.* (Ritter et al 2004)

Ensuring the understanding of the benefits of a network and converting it to commitment and action by all the network actors, original and new, can be stated as the ultimate purpose of network management. McGuire (2002) is in line with this argument and declares that facilitating effective interaction among all the players; actors and stakeholders, is one of the most critical activities for a network manager. The role of a network manager is to be more about inspiring, sharing knowledge, participating, combining key aspects and co-creating the value of the network, with the network, instead of managing the actors and their actions in the network. This allows the entire network and all actors in the network to concentrate on their core knowledge while learning and innovating together. Network managers need to be flexible and adaptive, and should change from striving to control and direct networks to focusing on participating and cooperating in networks, as this gives the actors as well as the network more freedom to evolve and develop. (Wilkinson and Young 2002; Mangs forthcoming) These tasks and characteristics of network management are similar to the ones identified as the one of mediators (see table 1) (e.g. Jyrämä and Äyväri 2007, Ståhle et al. 2004, von Korgh et al. 2000). In this study we will look into the network managers' differing roles alongside the network management process.

	Cultural intermediary	Brokers	Translators	Activists	An invisible hand
Authors	Bourdieu 1984 McCracken 1986 du Gay et al. 1997 Karppinen-Takada 1994, Salmi 2006	Wenger 1998, 2000; Brown & Duguid 1998 Ahola et al. 2004;	Brown & Duguid 1998	von Krogh et al. 1997, 2000	Mittilä 2006
Relating concepts		Boundary spanners Knowledge broker Inward and outward mediating		Initiator (Mittilä 2006) Catalyst as making something happen (Ståhle et al. 2004)	Catalyst as a creator of structures (Ståhle et al. 2004)
Main tasks	- To create meaning. - To mediate between differing fields or worlds. - To mediate between national cultures.	- Act in the area of overlapping communities of practice trying to build ties between the two communities. - Introduce elements of the practices of one c-o-p into another c-o-p.	- Framing the interests of one community in terms of another community's perspective.	- To bring different people and groups together to create knowledge. - To create spaces and occasions for joint actions. - To make something happen.	- To create structures and facilities for joint action. - To create dynamic structures, e.g. networks.

Table 1. The roles of network manager as mediators (Jyrämä and Äyväri 2007)

Earlier we stated that our interest lies in the systematic process of networking, which refers to all the actions done in the network by all the actors. These actions are an outcome of all the interactions in the network and therefore much of the networking consists of reactions to other actors' actions and is modified by these actions. (Ford et al 2002) Any managerial action done in the network is something that others react to as a part of their networking. Through a systematic approach the understanding of the network each actor has (of the network picture) can be affected and changed over time (Ford et al 2002). We consider network management as such a systematic approach that shapes the networking of actors in the network.

The network management model for systematic networking to ensure innovation scalability

Network management can be seen as a process where events take place in a certain order (Doz 1996) or as functions that need to be done to create and maintain a network (Agranoff and McGuire 2001, Mandell 2001, Rathemayer and Hatmaker 2008). In our study we will apply a modified version of the network management model designed for practice-based innovation and implement it to our case of innovation network. (Järvensivu et al 2011) The original model was created to describe a network management process that ensures systematic networking and was created based on an empirical study of network management in eight networks. The idea of the model was to depict the managerial actions that need to be done in order to successfully create, maintain and disseminate a network. In our analysis, we make a distinction between the actions of the network manager and other actions in the networking process. Our stand to the network management model is that it depicts what needs to be done in the network in each phase (phases 1-4) and that network management is the actions done by the appointed network manager in order to assure this systematic process of networking as pictured in figure 1. The figure also indicates that there are managerial actions that need to be done in order to create a network and invite actors to join. Similarly there are managerial actions that need to be done after the network has disseminated, especially in the case of a scalable innovation. (Järvensivu et al 2011) Scalability of the result of the networking is taken into account throughout the process and different ways and areas to scale the innovation to should be furthered in each of the phase.
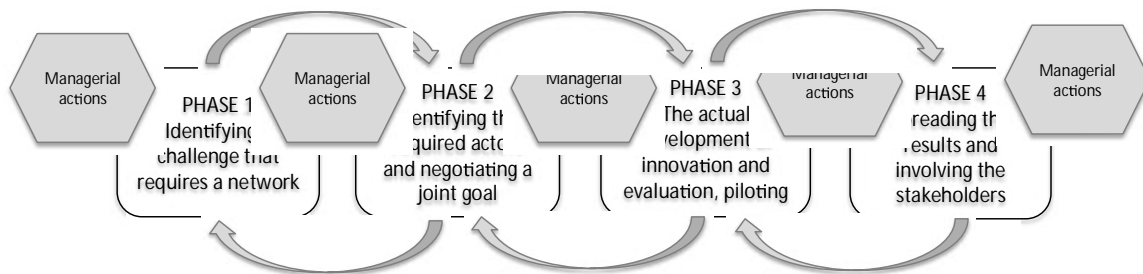

Figure 1. The process of systematic networking and network management (Modified from Järvensivu et al 2011)

The process starts from identifying a challenge, a need for a network, and continues to the assessment of the needed resources and actors that possess these resources. According to the model the network devotes time to the creation of trust and commitment and before starting the actual development creates joint goals and procedures for the network. Only after the network has agreed on joint goals and on how they should pursue the development of substance, should the network devote most of the time to the development. The model includes spreading the results of the network, which is the final

phase of the networking process. An important part of the process is constant evaluation, which indicates, for example, whether the network is ready to proceed to the next phase. (Järvensivu et al 2011) In this paper we study a network that is designed to follow this process and analyze the roles the assigned network manager(s) has adopted during the process. The negative and positive critical incidents have allowed us to find and analyze the actions and roles of network manager.

METHODOLOGY

We consider our single case study a strategy, which allows several different research methods and facilitates the understanding of complex social phenomena (Flyvberg 2006). Case study is considered an advantageous research strategy when direct contact with the individuals involved is possible (Yin 2009), as is the case in this study. The use of a single case is advisable, since we are studying a unique case (Yin 2009), as cases regarding innovation often are. In addition, Dyer and Wilkins (1991) state that focusing on a single case study gives the researcher(s) a deep understanding of the case and can lead the researcher to unveil new theoretical relationships or to question old ones. This study uses triangulation, i.e. the use of multiple methods, (Saunders 2007) to raise the quality of the research (Patton, 2002; Silverman, 2006) and the reliability of the results (Gummesson 1991).

We use three qualitative research methods, as we aim to gain a deep understanding of the case (Patton 2002) and the interrelationships within the case (Stake 1995). Firstly, the network managers provide researchers with all their email exchange regarding the case. This form of written data (Koskinen, Alasuutari and Peltonen 2005) is seen to be an important part of our study, as a researcher cannot influence the raw data from the correspondence. Secondly, the researchers participate in the networks' workshops and meetings. We see this kind of direct formal observation, which includes little or no participation (Yin 2009) as another important form of gathering data, as the researchers experience, see, hear and learn things during the observation that they would not do through other forms of data collection. Thirdly, the researchers interview some of the main actors of the networks.

The focus of this study is on analyzing the impact positive and negative critical incidents have on the network in question rather than on the critical incidents per se. We are identifying the important incidents in the networking process to understand the dynamics of the network and the network manager's roles in ensuring the success of the networking process. Critical incidents in networks are considered important as they might change the nature of the relationships in the network. We use critical incidents to build an understanding of the effects the incidents and the reactions of the network manager have on the network. The (network) manager is constantly exposed to critical incidents, and needs to be able to deal with them on short notice (Söderholm, 2008). Critical incidents have changed the studied network or at least redirected the process and required the network manager to facilitate the processes of innovating and networking.

The quality of this study and its strengths and limitations are discussed to facilitate the readers' ability to make their own conclusions regarding the study (Gummesson 1991; Yin 2009) and to gain the readers trust (Alam 2005). Reliability and validity; the most important concepts regarding credibility (Wallendorf and Belk 1989) are taken into consideration throughout the study, as one of the purposes of the study includes the scalability of innovations such as this. This facilitates the replication as well as generalization of this study.

THE CASE

This case describes a networking process of an urban innovation, and especially the managerial actions and adopted roles of an appointed network manager. The innovator agency in this case is a network of five core organizations and three additional actors. Most of the organizations of are either in the construction or service industry, while one of the organizations is a public transportation organizer. Two of the core organizations are private companies, one public organization, while the remaining two are non-profit organizations. Each actor has previously developed new ways of conducting the business that are innovations.

The urban innovation in question is a social innovation, which combines a) a new type of a housing solution for selected customer groups utilizing modular structure, b) a service portfolio to support the quality and communality of living and c) a new type of funding solution for acquiring an apartment. Human needs were the starting point of the innovation as it has been suggested that the focus of social urban innovations lie on the satisfaction of human needs (Moulaert, Martinelli, Gonazález and Swyngedouw, 2007). The network as an actor operating together is a new way of operating – an innovation in itself. However, one needs to bear in mind that innovations (and especially service innovations) often emerge over time and through continuous interaction between many actors. The relationships that these actors form often result in networks. (Toivonen and Tuominen, 2009) In short, innovation is increasingly becoming an activity that necessitates a network (Salminen and Harmaakorpi, 2012; Mangs, forthcoming).

The process of networking spans from the initial idea for the innovation to the network clarifying the innovation concept and determining the final strategy for implementing and scaling the innovation. The scalability of the innovation has been designed to be a continuous effort that would gain ground alongside the innovation process and was piloted by participating in an innovation competition to a certain new urban development area, when the urban innovation at hand was still in its design stage (see e.g. Valovirta et al 2011). In this case the network was formed to innovate and new actors were induced to the network when the process went forward. Eventually the innovation capabilities of the core network proved to be

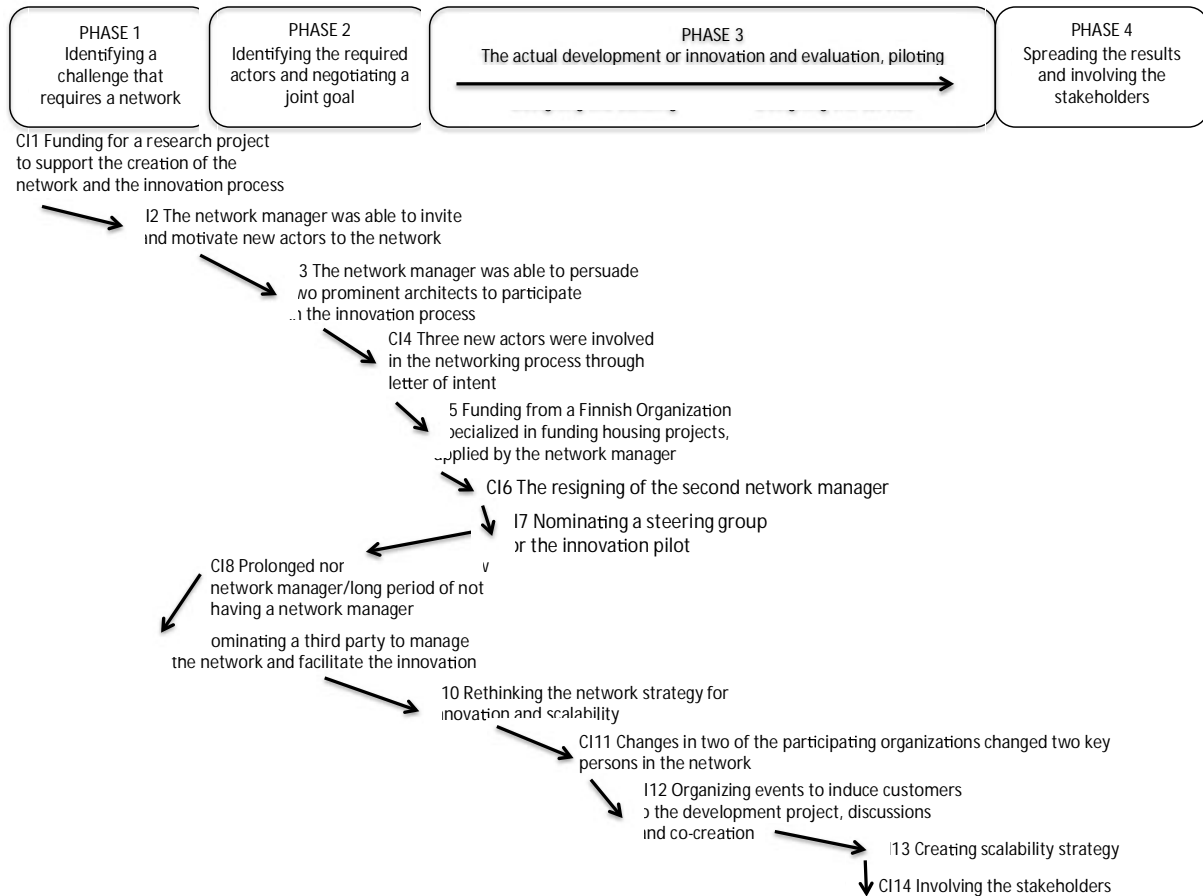insufficient and the network manager initiated adding these new actors to the network.

Figure 2. The positive and critical incidents (CI) induced by the network manager or external factors

In the following we present our analysis of the process and its management in each of the four phases. We also identify positive and negative incidents that in their part explain the networking process and its management (see figure 2). It is important to note that the network planned to follow the networking and network management model from the beginning and accepted the systematic network management process as an enabler for the scalability of the innovation (see e.g. Järvensivu et al 2011; Agranoff and McGuire 2001; Rethemayer and Hatmaker 2008). Scalability of the innovation was part of the innovation process and the network determined goals for scaling. The main goal of the network was to implement its innovation to a new district that was being developed in central Helsinki, an area by the sea, where one of the city's biggest ports had been for decades. This would be the test/pilot of the innovation, -a new way of operating and creating a city block. In

addition, the network had several urban districts in mind as places where the innovation could be scaled up, and therefore closely followed these areas from the beginning.

Phase 1: Identifying the challenge that requires a network
The activist (network manager 1) who initiated and created the network came from outside the final five core network actors, but he gave up his role as network manager when the network started to operate. He had an important role in acquiring funding for the research project around the innovation (CI1) and he invited and motivated the actors to participate in the innovation process (CI2). From the beginning of the actual networking the network manager (network manager 2) came from a private organization, first from within the network and later (network manager 3) from outside from stakeholders.

Already in a very early phase as an effort to scale the innovation, the network, by an initiative of the network manager (2), applied to a program called Developing Apartment Building (Kehittyvä Kerrostalo), which is managed by the City of Helsinki. This was considered a good avenue for new opportunities for the network to scale their innovation. The network also considered another urban area close to Helsinki as a potential place to scale the innovation and participated in an innovation competition. The initiatives for these scaling efforts came both from the manager as well as the participants; yet the manager (2) took the role of being **the activist** in these scaling efforts. (See e.g. von Krogh et al 2000)

> CI1 (+): The acquisition of funding for **a** research project to support the creation of the network and the innovation process
> CI2 (+): The network manager was able to invite and motivate the actors to the network

Phase 2: Identifying the required actors and negotiating a joint goal
What the network actors had in common was an interest in new types of living solutions directed especially to the elderly. All actors considered the promotion of communality to be one of the main ideals behind the network. Thus they all shared somewhat similar values and norms that enabled joint working, and therefore the network manager (2) rarely needed to engage in the role of a **translator.** (see e.g. Jyrämä and Äyväri 2007). However, the network manager (2) was very cautious in selecting new actors to the network and his aim was to select actors that could finance and participate in the actual construction, while the actors who potentially had resources in the service-side of the innovation and scalability were ruled out (CI3). This emphasized the role of **a gate-keeper** as **an inhibitor** of knowledge sharing and innovation.

The network manager was also so driven by the innovation and its development that little time was spent on creation of trust and commitment among the actors. The lack of these together with the desire to disclose information later showed in the meetings when all actors did not have all the information. After a year of development actors still expressed

frustration of not knowing what their actual role in the network was. Thus, we claim that the network manager (2) failed to act as **a broker.** In this phase of the process the network manager (2) acted successfully as **the activist** by pursuing the network to apply for funding for the development work (CI5) and before that initiated the involvement of three new actors to the network through a letter of intent (CI4).

> CI3 (+): The network manager was able to persuade two prominent architects to participate in the innovation process
> CI4 (+): Three new actors were involved in the networking process through letter of intent
> CI5 (+): Funding from a Finnish organization specialized in funding housing projects, applied by the network manager

Phase 3: The actual development or innovation and evaluation, piloting
The main actors in the network constantly evaluated the composition of the network and often agreed that new members should be added or at least the network stakeholders analyzed and involved in the network. Usually the network decided to postpone the involvement of new actors and settled for informing the stakeholders about the network or the progress of the innovation. This was also the case with users; their importance in the development process was acknowledged but the network decided to postpone their involvement, as initiated by the network manager (2). Throughout the process this network manager emphasized confidentiality of all information passed to the network by him. This applied to all output from the network meetings and workshops. The network manager clearly pointed out the reason, a fear of competition. Hence the network manager overtook the role of **gate-keeper,** allowing or barring access to the network. (see e.g. Wenger 1998) The network manager (2) adopted this role even in appointing a steering group (CI7) for the pilot by deciding who should be part of the group and by leaving one of the network actors outside the group.

Since the network manager was a very strong person who preferred doing things himself, the network became very vulnerable after his resignation (CI6). The fact that both, second and third, network managers came from private organizations allowed them to contribute and concentrate on the network. (see also Jyrämä and Ahola 2005) After the resignation of the network manager (2) the network was without a manager for 4 months, during which the network was idling. (CI8) The new network manager (3) is paid by the hour and started his work by contacting all the stakeholders, since the old network manager (2) had taken much of the information with him acting as **the gate-keeper** of information and knowledge (CI9). The new network manager (3) also proposed that the network should have a strategy for its work and suggested three different alternatives out of which the network through discussion could choose the most suitable for the network and its desired goals. (CI10) He was determined to develop the service and conceptualize that with the network. Thus the new network manager started his management through the roles of **an activist** and **an invisible hand**. He also started engaging the network actor that was previously dropped outside the actual development work back to the network,

which means that he adopted the role of **a translator**. By the network managers (3) suggestion the network also arranged opportunities for potential customers and the network members to discuss and explore existing housing solutions together. (CI10)

The way each type of actor was separated into smaller working groups based on their specialty rather than mixing the genres seemed to further emphasize the differing conceptualizations of the joint innovation. Thus there seemed to be a need for **a translator mediator** despite the seemingly similar values and aims. (e.g. Jyrämä and Äyväri 2007) The third network manager took on this role from the beginning. The need for that role was highlighted by the fact that several key actors have left the network during the networking process (CI11). Customers were also introduced to participate in innovating by offering them a change to discuss the innovation. (CI12)

> CI6 (-) Resigning of the second network manager
> CI67 (+): Nominating a steering group for the innovation pilot
> CI8 (-): Prolonged nomination of the new network manager/long period of not having a network manager
> CI9 (+): Nominating **a** third party to manage the network and facilitate the innovation
> CI10 (-): Rethinking the network strategy for innovation and scalability
> CI11 (-) *Changes* in two of the participating organizations changed two key persons in the network
> CI12 (+): Organizing events to induce customers to the development project, discussions and co-creation

Phase 4: Spreading the results and involving the stakeholders
The networking process proceeded in a slower pace than planned. There are several reasons for that. For example, having a strong and driven network manager (2) facilitated the network and pursued early development of the innovation not giving much space for the creation of trust and commitment as suggested in the network management model. This meant that the third network manager had to start from motivating the actors again and returning to the scalability issues of the innovation by initiating a scalability strategy. Earlier the development of the innovation was mainly done by the network manager (2) himself, while the efforts of the network concentrated on the details of this plan and planning the actual construction. Stakeholders, including both the potential customer and the municipal actors, were involved in the development of the scalability strategy. (CI13, CI14) This phase required **an activist** and **a mediator**.

> **CI13:** Creating scalability **strategy**
> **CI14:** Involving the **stakeholders**

DISCUSSION AND RESULTS

In this study our aim was to look into the networking process of an innovation network and extend the knowledge of network management and more so the understanding of the roles of a network manager in a networking process where the network from the beginning has been aiming to create a scalable innovation. We approached the topic through the network management process (Järvensivu et al 2011) and critical incidents. The task of these critical incidents was to show the roles a network manager could take during the networking process to facilitate networking and the scalability of innovation. Our main finding concerns the roles of network management that enable a successful networking process of a scalable innovation (figure 3).
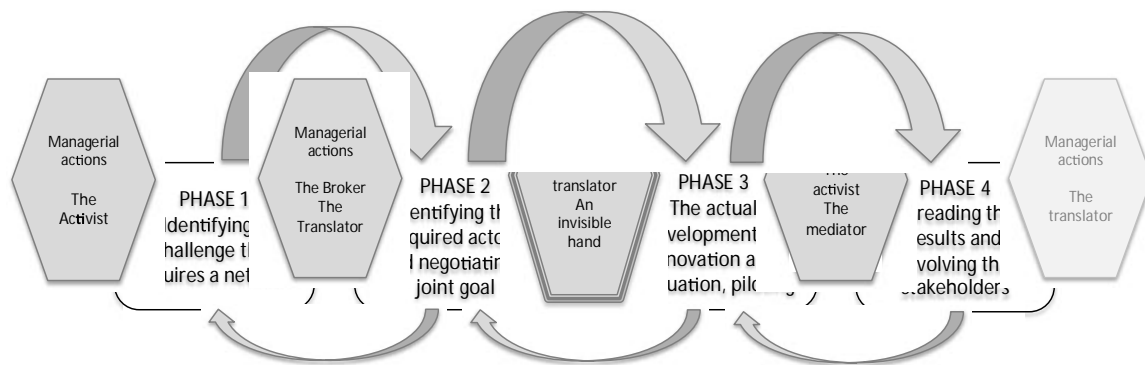

Figure 3. The enabling roles of network manager during a networking process of a scalable innovation

We claim that network manager as **an activist** enables networking in the first two phases, but that in the third phase the network manager should step back and give more responsibility to the other network actors. Again, in scaling the innovation, the network manager can act as an activist, but the network manager should be aware of not acting as **the gate-keeper**, which would discourage other actors from taking responsibility of the scaling process and close the network from new resources that would be needed in the scaling of the innovation. The role of **a translator** is more important the more different backgrounds and diversified understanding the actors in regard the networking process have. The network manager should adopt the role of a translator in the second phase of the networking process. The roles of **translator** and an **invisible hand** are needed in the actual innovation phase. The studied network is still in the process of innovating. We have therefore not been able to analyze the managerial actions required in assuring the introduction of the innovation in different markets (scaling), but we tentatively suggest that this phase would benefit from a network manager that is able to adopt the role of a translator (see for example Järvensivu et al 2011).

We also suggest that in networks, where the network manager changes in the middle of the process, the roles the previous network manager/s has taken has an impact on the

roles the following network manager needs to adopt to ensure successful networking (see figure 2). In this network the beginning of the networking process was marked by the network manager's (2) dominating management style and concealment of information as well as closing the network from new actors. As this network manager acted as an inhibitor, the following network manager had to adopt the roles of an activist and an invisible hand.

Edvardsson and Roos (2001) as well as Backhaus and Bauer (2001) state that negative critical incidents might have a greater impact or be more significant than positive critical incidents. This case study suggests that this also seems to be the case in networks and in network management. Regarding the network management model, the process of this network was dominated by managerial actions and little room was left for the creation of joint understanding, trust and commitment. The process phases 1 and 2 were especially dominated by managerial actions when the manager created an innovation and the role of the other actors was to merely accept and comment on the innovation. In the effort to scale the innovation the network was more active and presented possibilities for scaling and took responsibility in communicating stakeholders regarding these possibilities. As predicted by the network management model, the network was later forced to go back to the beginning of the process and re-examine the justification of this network as well as the innovation itself. The re-examination of the innovation and its scalability was also a result of externally induced incidents.

McGuire (2001) declares that facilitating effective interaction among all the players is one of the most critical activities for a network manager. Thus our results emphasize the key role of the network manager as facilitating joint activity and enabling innovation to emerge and be scaled. Following Ritters et al (2004) words we emphasize managing with actors or even stronger, managing by supporting actors, rather than managing actors. Thus, in analyzing the network management of this particular network, we have come to the conclusion that there in fact are some challenges that are a result of the dominating roles of a network manager. We have identified four such challenges:

1) Striving for short-term progress and disregarding the creation of trust and commitment.
2) Opting for confidential information instead of open communication and information.
3) Vulnerability of the network because of the changes in the managerial position.
4) Failure to facilitate communication between the actors and to the stakeholders.

A challenge for this study was that it could be difficult for the researchers to evaluate the importance of a single incident; what one considers important might be an everyday event for someone else. In addition, the results can sometimes be clouded by recent unrelated events. (Johnstone, Wilkinson and Ackers, 2010) The researchers strived to be as objective as possible throughout the study by observing instead of actively participating in the network. Several of the critical incidents in our case were somewhat intertwined, and therefore difficult to separate from each other. This is not unique for our

study, but appears in other studies as well (see for example Cope and Watts, 2000). The entangled incidents make the differentiation of the consequences of the incidents as well as the reactions to separate incidents more difficult, which was taken into account.

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