

Network Conception in a Service Development Network - MobileTV case

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ABSTRACT

In the present study we approach the phenomenon of the common understanding of network partners by offering some empirical evidence. We scrutinize a service development network that attempts to develop mobile TV service in Finland. The network consists 12 companies, such as infrastructure provider, media companies, telecom operators, mobile device manufacturer, system integrators and system providers. We use the idea of network pictures as an instrument to analyze and interpret how the specific actors in the MobileTV case perceived their network surroundings. This paper seeks to explain why network actors failed to develop a comprehensive appreciation of the service development project from the perspective of network pictures. We found that case network participants had substantially different network pictures. More specifically, we identified four types of clusters. With the illustrative case we conclude that the intra-organization-level and the focal network-level collective cognitive structures differ. To further study the focal network-level collective cognitive structures, we suggest the concept of network conception to stand for the phenomenon. The present study contributes to the research on collective cognitive structures by extending the understanding of individual-level and organizational-level cognitions to focal network-level social cognition.

Keywords –Network pictures, Network conception, Social cognition, Case study, MobileTV

INTRODUCTION

Recent developments in the field of business-to-business markets are turning to emphasize the role of cooperation. For example business model such as solution business is based on the value co-creation with network partners. Even competitive companies are forming co-competitive networks to enhance innovativeness, performance, and success in the market (Brandenburger and Nalebuff, 1996; Möller and Rajala, 1999; Quintana-García and Benavidas-Velasco, 2004; Luo, Rindfleisch and Tse, 2007). Thus, understanding these intentionally formed focal networks has become crucial for the competitiveness of a company.

In general, there has been a great deal of progress in understanding what networks are, how they are structured, how they operate, and even how they develop (e.g. Anderson, Håkansson and Johanson, 1994, Welch and Wilkinson, 2002). Regardless of the progress, there is still a lot we do not yet know. Besides focusing on the dynamics of networks, the academic research on the business studied seems to face the cognitive turn on the research interest. Doctrines from various disciplines taking more humane perspective are adapted to the field of business studies. According to Gary and Wood (2011), the more accurate mental models of the causal relationships in the business environment are linked to higher performance outcomes. Therefore, these subjective mental structures are a central concept to managing in networks, and thus a relevant issue for study.

Among the IMP group the cognitive turn has created the emerging discussion on a person's mental models. Based on the IMP group's ontological perspective, the network picture concept is developed to describe these managers' mental models (Ford et al., 2003; Henneberg, Mouzas, and Naudé, 2006; Henneberg, Mouzas, and Naudé, 2009; Corsaro et al., 2011; Ramos and Ford, 2011). There are also other related concepts referring to similar ideas as network pictures; network theories (Johanson and Mattson, 1992), network horizon (Anderson, Håkansson and Johanson, 1994; Holmen and Pedersen, 2003), network maps (Bolders, Johnston and Ridgón, 2001) and ideas or schemata (Welch and Wilkinson, 2002).

Our focus is, however, especially on network pictures, because accurate mental models of the causal relationships in the business environment and amalgamating these solitary mental models as a common network insight in organization has argued to lead to higher performance outcome and a competitive advantage within a business network as well as for the business network itself (McNamara, Luce, and Tompson, 2002; McNamara, Deephouse, and Luce, 2003; Mouzas, Henneberg, and Naudé, 2008; Gary and Wood, 2011). However, understanding of the company boundaries crossing collective cognitive structures seems to be lacking. We have knowledge about person-level cognitive structures (Hodgkinson and Johnson, 1994; Osborne, Stubbart and Ramaprasad, 2001; Henneberg, Mouzas, and Naudé, 2006), collective cognitive structures at the organization-level (Dougherty, 1992; Fiol, 1993; Bettis and Prahalad, 1995; Mouzas, Henneberg, and Naudé, 2008), but studies on the focal network-level, such as product or service development networks, are lacking. However, the extant research gives us indication that the focal network-level collective cognitive structures exist and it has effects to the performance of the network (Ramos and Ford, 2011).

In the present study we approach the phenomenon of the common understanding of network partners by offering some empirical evidence. We scrutinize a service development network

that attempts to develop mobile TV service in Finland. The network consists of 12 companies, such as infrastructure provider, media companies, telecomoperators, mobile device manufacturer, system integrators and system providers. We use the idea of network pictures as an instrument to analyze and interpret how the specific actors in the MobileTV case perceived their network surroundings. *This paper seeks to explain why networkactors failed to develop a comprehensive appreciation of the service development project from the perspective of network pictures.* To do this we compare and contrast the different viewpoints of the various networkactors. In order to do this, we utilize the state-of-the-art tool to study network pictures (Ramos and Ford, 2011).

Based on our analysis we find that case network participants had substantially different network pictures. We identified and named four types of network pictures. To further study the focal network-level cognition, the study builds theory by suggesting the concept of network conception to stand for the phenomenon. Thus, the paper contributes to the emerging research on collective cognitive structures (Fiol and Huff, 1992; Levine et al., 1993; Klimovski and Mohammed, 1994; Bettis and Prahalad, 1995; Henneberg, Mouzas, and Naudé, 2006; Mouzas, Henneberg, and Naudé, 2008; Corsaro et al., 2011) and to the literature stream in which network pictures are utilized as a research device (Leek and Mason, 2010; Ramos and Ford, 2011)

The paper is structured as follows. First, we describe the theoretical background, starting from the individual-level mental models and moving towards organizational-level social cognition. Thereafter, we present our empirical study. Based on the tool developed by Ramos and Ford (2011) we study and discuss the differences of the understanding of the surrounding network in the case companies. Building on the existing literature and empirical evidence we draw some conclusions and discuss the limitations of the study as well as avenues for further study the network-level social cognition, here named as network conception.

THEORETICAL BACKGROUND

Research on a person's cognitive mental structures dates back to the early 20th century. Prior research offers several disciplines to study a person's mental model, such as managerial and organizational cognition (Huff, 1992; Huff and Eden, 2009), the sense-making literature (Weick, 1995), psychology including social psychology (Markus and Zajonc, 1985; Markus, 2005), and cognitive psychology (Eysenck and Keane, 2010; Manktelow, 2008). These disciplines offer concepts, such as cognitive maps (Fiol and Huff, 1992), schemas (Markus and Zajonc, 1985; Harris, 1994), mental models (Hodgkinson and Johnson, 1994; Osborne, Stubbart and Ramaprasad, 2001), heuristics (Eysenck and Keane, 2010), dominant logic (Prahalad and Bettis, 1986; Bettis and Prahalad, 1995), and belief systems (Grube, Mayton and Ball-Rokeach, 1994).

Among the IMP group the cognitive turn has created the emerging discussion on a person's mental models. Based on the IMP group's ontological perspective, the network picture concept is developed to describe these managers' mental models (e.g. Ford et al., 2003; Henneberg, Mouzas, and Naudé, 2006; Colville and Pye, 2010; Geiger and Finch, 2010; Corsaro et al., 2011). According to Henneberg et al. (2009, p. 95) the network pictures can be defined as "the different understanding that players have of the business network in which their focal company is operating". Further, these subjective pictures of the network are claimed to be a result of idiosyncratic sense-making with regard to the main constituting

characteristics of the network in which their company is operating (Henneberg, Mouzas, and Naudé, 2006). Deriving from the ongoing nature of sense-making process, these network pictures are dynamic on their nature and constantly revised (Weick, 1995).

The existing body of literature on the network pictures focuses on defining the network pictures (e.g. Henneberg, Mouzas, and Naudé, 2006; Leek and Mason, 2010), discussing its nature (e.g. Colville and Pye, 2010; Geiger and Finch 2010), and scrutinizing its role in networking (e.g. Öberg, Henneberg, Mouzas, 2007; Corsaro et al., 2011). However, there has been evolved a differing view to the network pictures. According to Ramos and Ford (2011, p. 448) network pictures are defined as “an instrument that can be used either by researchers or managers to interpret how actors perceive their surroundings”. Based on this stream, the network pictures are defined as a research device that aims to capture or illustrate views that specific actors have of the environment. Thus, when studying the network pictures the difference between these two streams has to be noted. Given that our research is based on the latter perspective and we utilize the network pictures as a research device to understand actors’ perceptions of the surrounding network during a specific service development case, although we try to understand cognitions of a network.

The network pictures are found to be a multidimensional. Henneberg, Mouzas, and Naudé (2006) have proposed a set of eight interrelated building blocks of network pictures (boundaries, directionality, power, time/task, environment, focus, actors/activities/resources, and centre/periphery). Leek and Mason (2010) studied empirically network pictures at the dyadic relationship level and redefined the dimensions (Environmental forces; Actors and boundaries; Positioning/centre; Activities and resources; Focus Directionality of interactions; Time/task; Power). By taking more practical perspective Ramos and Ford (2011) have developed a state-of-the-art tool to capture actors’ perceptions in organizational network. According to Ramos and Ford (2011) network picture consist of four elements 1) focus , 2) weight, 3) consistency and specificity and 4) surroundings. The focus dimension consists of aspects related to the key areas of actor’s business network description such as actors, processes. The weight dimension, on the other hand, includes aspects that can influence individual’s perceptions such as moral principles. The consistency and specificity –dimension focuses on dimensions that allow comparisons between individuals’ views and views of his/her surroundings. Finally, surroundings –dimension clusters all dimensions that reflect individual’s picture on a general level e.g. overall structuredness. More specific list of the network picture dimensions and definitions can be found from the Appendix 1.

Besides the focus on the individual-level, the existing literature has in addition focused on the collective and organizational-level cognitions. Although previous research has had controversial approach on the idea of collective mind, Allport (1924), for example, does not believe that collective mind exists. However, she writes that “institutional thinking...is.. in the minds of individuals as they try to decide” (Douglas, 1986, p. 4). Also she, further, states that “Our social interaction consists very much in telling one another what right thinking is and passing blame on wrong thinking. This is indeed how we build the institutions, squeezing each other’s ideas into a common shape.” (Douglas, 1986, p. 91) Thus, some people may find consideration of group level-cognition problematic. Regardless of this it is important to face the controversy and work with ideas that urge us to develop a theory of “sociocognition” (Levine et al., 1993). Levine et al.(1993, p. 533) also found that “outside the laboratory and the school, cognition is almost always collaborative”. This finding has motivated a number of researchers to examine individual knowledge structures and find that within a group of individuals are, although they have their own knowledge structure about the surrounding

environment, some kind of collective knowledge structure is likely to emerge. Also it is likely to function as a mental model when imposed on an information environment. It gives it form and meaning. Thereby it serves a cognitive foundation for action, just like an individual collective template. The study of cognition at this level of analysis is thus a study of collective cognitive structures.

The hypothesized group-level knowledge structures, frames of collective cognitive structures, have been named e.g. collective cognitive maps (Axelrod, 1976), team mental models (Klimovski and Mohammed, 1994) and dominant logics (Prahalad and Bettis, 1986). The recent openings among IMP group are also attempting to understand the social cognition in business context (Mouzas, Henneberg, and Naudé, 2008), grounding on the extant understanding of networks (Anderson et al., 1994; Dyer and Singh, 1998; Halinen, Salmi, and Havila, 1999; Ritter, 1999; Gnyawali and Madhavan, 2001; Kranton and Minehart, 2001; Håkansson and Ford, 2002; Wilkinson and Young, 2002; Ford et al., 2003; Henneberg, Mouzas, and Naudé, 2006), knowledge (Hayek, 1945; Tsoukas, 1996; Hargadon and Fanelli, 2002), and collective mind (Weick and Roberts, 1992; Weick, 1995; Grant, 1996; Grant and Baden-Fuller, 2004). According to Mouzas, Henneberg, and Naudé (2008) these social cognition structures, named as network insights, are seen as the outcome of interplay between the factual physical and social artifacts that surround actors in networks, intervened on the retrospective cognitive schemata. Further, the organization's network insight is found to be the amalgamated outcome of multi-negotiations and heedful interactions at numerous differing levels within and between organization structures (Mouzas, Henneberg, and Naudé, 2008). However, studies on the focal network-level collective cognitive structures, such as product or service development networks, seem to be lacking.

RESEARCH DESIGN

In order to analyze the focal network's social cognition, a service development network was chosen to be scrutinized. The selection of the network was made by the means of theoretical sampling (Eisenhardt and Graebner, 2007). The emphasis was placed on the representativeness of a large scale service development network including multiple actors. In addition, access to data from the focal persons within the participation organizations was emphasized in the sampling. Finnish MobileTV development project was found to be the suitable one, since there was good access to the key players of the project and the project itself had a large scale network of different actors, but still the boundaries of the network (key players) could be easily identified.

CASE DESCRIPTION

According to the Ministry of Transport and Communications almost all (99%) of Finns aged 15-79 had a mobile phone in the autumn 2011. There were altogether 6,8 million mobile telephone subscriptions at the end of the year 2011. Whole population in Finland is appr. 5,4, million people. According to Finnpanel (a Finnish market research company) 94% of the TV programs were mainly watched through traditional TV sets. Every fifth person watched TV-programs from the internet, two per cent by phone and one per cent using tablet PC.

The case description gives a historical perspective on the lifestory of Finnish MobileTV, although the evidence was collected in a fairly short timeframe. The origins of case lay to the year 2001, when a global mobile phone manufacturer began to build an inter-organizational

network for creating a new value system. The idea was to build a mobile TV service by which consumers could watch TV broadcasts on their mobile devices. The negotiations included the largest telecom operators, media houses, global IT system integrators, public sector actors and ministries. Reviews of these actors are provided at the Table 1. The device manufacturer, as a hub-company, had the ideas, contacts and knowledge required to collaboratively create technology (DVB-H) and mobile TV systems including broadcasting system.

After collaborating for some years, one of the telecom operators became the hub-company. This happened 2005. The telecom operator started to pilot new products and services, thereby, leading the collaboration from development to commercialization phase. Additionally, a cluster called Forum Virium Helsinki and its leading project, Finnish Mobile TV, was established by a group of companies. Key actors also hereby aimed at making the possible, expected benefits for the companies more clear. The pilot experiment succeeded. Customers were interested in mobile TV service and they were willing to pay for them. Customers clearly desired mobility and interactivity.

However, ultimately the case was not very successful as there were problems with the commercialization process. First, the copyright issues concerning broadcasting rights and fees in the DVB-H network were a big challenge. Also the common resolution about the broadcasting of regular television feed could not be formed. There was some hope in mid-2007 in the form of small broadcast experiment, and case companies thought that the large scale broadcasting will actually start. However, Finnish Mobile TV never actually did make a it's big breakthrough. At the present, the Mobile TV network is still struggling to be able to offer the service.

DATA COLLECTION AND ANALYSIS

The research tool developed by Ramos and Ford (2011) was utilized in order to capture actors' network pictures in that network. The usage of the tool is based on the three steps. The first step contains the collection of visual and verbal data focusing on the questions about the network. The second step is coding the data by using the specific coding framework (Appendix 1). At the final phase the results from the previous steps are utilized based on the purpose of the research.

The first step of the research process was collecting the needed empirical data focusing on the questions about the network. Interviews were used as data collection method for verbal data, because they suit well for research requiring understanding of such phenomena or experience that are delicate. More specifically, interviews provide opportunity for clarification and to create in-depth understanding (Eriksson and Kovalainen, 2008). The key informants (i.e. business and technology managers responsible for the mobile TV business in their companies) came from the organizations involved in the development of the mobile TV service. They all have been involved in the networking process during the different phases of the case. The choice of key informants was conducted in cooperation with the project manager of Finnish mobile TV consortium in order to ensure that all of the key actors would be taken into account (there were 12 organizations involved at the project at the time the interviews were conducted).

Our primary data-collection method was the semi-structured interview. The data includes 17 in-depth interviews and the duration of each interview is on average one hour. Table 1

provides details of the interviews conducted. The questions covered themes such as the development and state of the network, processes of the network, critical events during the case in the network, dynamics between actors, and the positioning of the focal actor in the case network. We also collected data from public sources such as company and project web pages and public newspapers and news archives in order to achieve in-depth understanding of the case. Interviews were conducted by five researchers who had complementary theoretical understanding. Ramos and Ford (2011) suggest also that networks under study should be also visualized. However, we didn't include the visual data, since in our case we studied one network in-depth and the network had clear boundaries.

Table 1. Interviews conducted for the study.

<i>Role</i>	<i>Employer</i>	<i>Month/year when the interviews were conducted</i>
1 Director, Business Development	Media company 1	2/2007
2 Director, Economic Development	Public sector	3/2007
3 Technology specialist	Telecom operator 1	3/2007
4 Director, R&D	Telecom operator 1	3/2007
5 Director, R&D	Telecom operator 1	3/2007
6 Director, Sales	System integrator 1	3/2007
7 Director, Business Development	Device manufacturer	3/2007
8 Senior technology manager	Device manufacturer	3/2007
9 Director, Ventures	Device manufacturer	1/2008
10 Senior manager, Ventures	Device manufacturer	1/2008
11 Chief of Development	Media company 2	2/2007
12 Development Manager, Tech. Development	Service provider 1	2/2007
13 Head of Department, Tech. Development	Media company 3	3/2007
14 Project Manager	Telecom operator 2	2/2007
15 Service Manager	Infrastructure provider	3/2007
16 Director, Development	System integrator 2	3/2007
17 Application Developer	Service provider 2	2/2007

The second step according to the used research tool is coding the data with the specific coding framework. This deductive content analysis (Miles and Huberman, 1994; Moretti et al., 2011) was made with the help of Atlas.ti software. The interviews were coded according to the dimensions of network pictures introduced by Ramos and Ford (2011). The introduction of the dimensions as they are understood at the present study is made at Appendix 1. The most intensively mentioned sub-dimension(s) of a dimension was marked to a table where the summary of the network pictures was formed. The summary table is introduced at Table 2. The results were also doubled-checked, discussed and agreed together with the authors of the present paper.

At the final step the individual network pictures were grouped based on the summary of the network pictures (see Table 2) and the in-depth understanding of the studied case. According to the analysis four distinctive clusters of network pictures could be identified. The results of the final step were discussed and adjusted thoroughly with the authors of the paper to ensure consensus of the amount and composition of the identified clusters. At the following chapter

the identified clusters are discussed, including depiction of the network pictures' nature within identified clusters and discussion of the identified clusters' differences.

ACTORS' NETWORK PICTURES IN THE MOBILETV NETWORK

Based on the analysis of the seventeen network pictures from the representatives of twelve companies described above, four separate clusters of network pictures could be identified. The first cluster included six network pictures from four different companies. The second cluster included five network pictures from two companies. The third cluster included three network pictures from three companies. Finally, the fourth cluster included three network pictures from three companies. The following Table 2 summarizes the network pictures based on the research tool. In addition, the table addresses the four identified clusters of the network pictures and aggregates the dominant sub-dimensions in each cluster. More thoroughly depiction of the dimensions in the table is offered at Appendix 1. At the following the findings are discussed more thoroughly. Firstly, the nature of the network pictures within the each identified clusters are discussed. Secondly, the differences of the identified clusters are discussed.

Table 2.Summary of the network pictures.

Groups	Dimensions	Sub-dimensions	Participating companies																				
			Cluster 1						Cluster 2				Cluster 3			Cluster 4							
			Media company 1	Public sector	Telecom operator 1	Telecom operator 1	Telecom operator 1	System integrator 1	DOMINANT SUB-DIMENSION	Device manufacturer	Device manufacturer	Device manufacturer	Device manufacturer	Media company 2	DOMINANT SUB-DIMENSION	Service provider 1	Media company 3	Telecom operator 2	DOMINANT SUB-DIMENSION	Infrastructure provider	System integrator 2	Service provider 2	DOMINANT SUB-DIMENSION
Dimensional Group 1. Focus	1.1 Actors	1.1.1 On Themselves					1						1							1	1	X	
		1.1.2 On the Company	1	1	1	1	1	X		1	1	1	1	X	1	1		X	1				
		1.1.3 On the Surroundings					1			1						1	1	X					
	1.2. Processes	1.2.1 On Actor Bonds		1						1		1								1	1		X
		1.2.2 On Activity Links	1	1	1	1	1	X	1	1	1	1	1	X		1	1	X			1		
		1.2.3 On Resource Ties								1		1				1				1			
	1.3 Actors/Processes	1.3.1 On Actors	1	1	1	1	1	X	1	1	1	1	1	X	1	1	1	X	1	1	1	X	
		1.3.2 On Relationships								1													
	1.4 Actors' features	1.4.1 On Actors' Resources		1						1	1					1				1			
		1.4.2 On Actors' Problems	1	1	1	1	1	X			1	1	1	X	1	1	1	X			1	1	X
		1.4.3 On Actors' Aspirations																					
	1.5 Time span	1.5.1 On Past Events								1	1	1	1	1	X	1	1	1	X		1		
1.5.2 On Present Events		1	1	1	1	1	X	1								1			1		1	X	
1.5.3 On Future Events					1	1	1																
1.6 Function	1.6.1 On Own Function									1		1							1	1	1	X	
	1.6.2 On Others' Function	1	1	1	1	1	X	1	1	1	1	1	X	1	1	1	X						
Dimensional Group 2. Weight	2.1 Normative	2.1.1 Normative Weight	1	1	1		1	X	1	1										1	1	1	X
		2.1.2 Non-Normative Weight				1	1				1	1	1	X	1	1	1	X					
	2.2 Moral	2.2.1 Sense of Should															1						
		2.2.2 Just a View	1	1	1	1	1	X	1	1	1	1	1	X	1	1	1	X	1	1	1	X	
	2.3 Knowing What is going on	2.3.1 Important Knowing What is Going On	1	1	1	1	1	X	1	1	1	1	1	X	1		1	X	1	1		X	
		2.3.2 Not Important Knowing What is Going On															1					1	
	2.4 Internal Procedures	2.4.1 Relevance of Internal Procedures	1	1	1		1	1	X			1	1										
		2.4.2 Non Relevance of Internal Procedures				1				1	1			1	X	1	1	1	X	1	1	1	X
Dimensional Group 3. Specificity/Coherence	3.1 Coherence with Board Identity	3.1.1 Coherence with the Board's Explicit Identity	1	1	1	1	1	X	1	1	1	1	1	X	1	1	1	X	1		1	X	
		3.1.2 Non-Coherence with the Board's Explicit Identity					1														1		
	3.2 Situation Specificity	3.2.1 General Situations			1												1				1		
		3.2.2 Specific Situations	1	1	1	1	1	X	1	1	1	1	1	X	1		1	X			1	1	X
	3.3 Actor Specificity	3.3.1 Groups of Actors		1							1		1			1	1	1	X			1	
3.3.2 Specific actors		1		1	1	1	X	1		1	1	1	X						1	1	1	X	
Dimensional Group 4. Overall view of surrounding	4.1 Stereotype	4.1.1 A Network	1	1	1			X	1	1	1	1		X	1	1		X			1		
		4.1.2 A Supply Chain or Other Stereotyped View				1	1	1	X			1	1					1			1	1	X
	4.2 Consistency	4.2.1 Consistency	1	1	1	1	1	X	1	1	1	1	1	X	1	1	1	X	1	1	1	X	
		4.2.2 In Conflict										1											
	4.3 Structuredness	4.3.1 Structured	1	1	1	1	1	X	1	1	1	1	1	X	1	1	1	X	1	1	1	X	
		4.3.2 Unstructured																					
	4.4 Stasis	4.4.1 Evolving	1	1	1	1	1	X	1	1	1	1	1	X	1	1	1	X	1	1	1	X	
		4.4.2 Static																					
	4.5 Broadness	4.5.1 Broad	1	1		1	1	1	X	1	1	1	1	1	X						1	1	
		4.5.2 Narrow			1											1	1	1	X			1	1
	4.6 Comprehensiveness	4.6.1 Comprehensive	1	1	1	1	1	X	1	1	1	1	1	X	1					1		1	
		4.6.2 Non-Comprehensive						1									1	1	X			1	1
4.7 Conflict/Collaboration	4.7.1 Power / Conflict	1			1																		
	4.7.2 Collaboration	1	1	1	1	1	X	1	1	1	1	1	X	1	1	1	X	1	1	1	X		
4.8 Actors as Providers	4.8.1 Customized Offers	1								1	1	1	1	X									
	4.8.2 Standardized Offers		1	1	1	1	1	X							1	1	1	X	1	1	1	X	

NATURE OF THE NETWORK PICTURES WITHIN THE IDENTIFIED CLUSTERS

Network pictures included in Cluster 1 are based on the representatives from four companies. Network picture in this cluster are mostly focusing on the present event and even future events. The cluster includes the only representatives having future oriented view in the network. In addition, representatives in the cluster seemed to have high interest towards the internal procedures of the MobileTV network's actors. For example, the Media company

1's representative described quite narrowly the Device manufacturer's internal procedures and development phases by stating:

The hub firm [Device manufacturer] invented MobileTV, that is clear. They had the vision required. Of course there might be also other opinions, but the company [Device manufacturer] has also manufactured televisions with their own brand. They also have persons who have been developing televisions at the time. These persons have been developing, besides television, the digital television as well. Device manufacturer was quite significant manufacturer of the DVB-S set top -boxes at the time.

Although having interest towards internal procedures, the representatives in the Cluster 1 perceived the environment quite broadly. They held quite normative view of things, describing how things should be done in future. The stereotype how an actor perceived the surrounding seemed to vary quite extensively. Half of the representatives perceived the surrounding business environment to be formed as network, whereas the other half found it to be more like a supply chain. Two representatives in this cluster found power relations and conflicts to be future challenges in the network, although thus far the collaboration in the network has been successful without any conflicts. For example R&D director from Telecom operator 1 stated as follows (note: Telecom operator 2 is a competitor for Telecom operator 1):

And now it is the other way around. Now there is Telecom operator 2 in a leading role of the development consortium. We have kept in contact with some smaller companies in producing content, but we actually withdraw from the [MobileTV] collaboration. However, technical development has continued.

Summing up the features of the cluster, we call this cluster as the Future Oriented Cluster. Although the dominant sub-dimension in the time span dimension is not the future events, the unifying factor among the representatives in the cluster is the focus on present events and future orientation.

The second identified cluster includes two companies, but five representatives. The time span of the representatives was mostly on the past events. They thought more intensively activity links than about actor bonds or resource ties. In addition, the representatives spoke mostly on behalf of their entire company and even the surrounding MobileTV network. Their overall view of the surrounding was significantly broad. Their network horizon seemed to include, not only native actors, such as companies, ministries, and substitutes, but global actors as well. These representatives focused mostly on the big picture of the developed service. The finding is quite reasonable since the actors are operating globally in various markets. For example a senior technology manager in Device manufacturer described the global competition and the business set up as follows:

...Koreans started, they had many kinds of projects related to MobileTV but with slightly different technology and for slightly different purposes. And also in Japan. But the speed of technology development to various market areas was the real wake -up-call. And then many competing standards began to emerge.

In addition, the Director of business development in Device manufacturer described the drivers of the collaboration as follows:

Hard to say how it would be in other countries. In such a larger country like Germany, the companies are also bigger and they are more powerful and also markets are bigger, thus there is no need for such collaboration as in Finland. Another example is USA. If one operator has 40-50 million customers, it is

big enough company to independently pilot MobileTV if it wants to. In Finland we have 5 million customers and they are divided between, at least, to three operators.

Besides having broad perspective, the representatives in the cluster seemed to perceive the offerings of the actors to be customized on their nature. Contrasting almost all other representatives, the cluster 2 representatives found the situation to be very specific and the actor's offerings differ from their usual ones. In addition, their mental set up about the surrounding environment was mostly network-like and they described the network comprehensively. To sum up the cluster, we named it to be the Broad Perspective Cluster.

The three representatives in Cluster 3 were from three separate companies. Service provider 1 and Media company 3 are national actors owned by the Finnish state and operating locally in Finland only. The third company in the cluster (Telecom operator 2) has also most of its markets in Finland only. Thus it is not surprising that these representatives seemed to have quite narrow perspective on surroundings, focusing on Finnish markets and actors. These respondents also seemed to have non-normative weight on their attitude, mostly speculating the past events. At the following there is an excerpt from the interview of the Head of department, Tech. Development in Media company 3.

...well, I have this kind of memory that, probably, if you discuss with Device manufacturer they will know it better. It can be that I am right or wrong, I don't know, but I have the memory, that Device manufacturer did search for different partners and led the discussions and ultimately proposed a collaborative project. This is how I remember it.

The representatives in Cluster 3 perceived the actors involved to the MobileTV network to be just a group of actors. Thus, they did not focus on the details of these actors or their position in the network. Still, most of them perceived the surrounding to be a network rather than any other stereotype. Summing up the described above, the cluster is named to be the Narrow Perspective Cluster.

The final identified cluster in the network pictures among actors of MobileTV network included the three representations from the three companies. Almost all representatives in this cluster seemed to perceive themselves to be the "focal" actor, speaking about their personal function in the MobileTV project. In addition, they thought on behalf of their own function as following example from the interview of the Director in System integrator 2 illustrates.

My goal was mainly a technology trial. I had the gap. I tried to bring it out in there. I addressed the issue. I pointed out that I wanted to something new to emerge, something also internationally important.

The representatives in Cluster 4 held a normative view on things, speaking frequently for example what should be done next and what are the right directions of the future. They perceived relationships mostly in terms of actor bonds, although the activity links were mentioned as well. The representatives focused mostly on the present events. The overall view of surroundings was quite narrow, which is interesting because the System integrator 2 is operating in various market areas around the world. Almost all representatives held non-comprehensive perception about the surroundings, focusing only superficially about other actors in the network. To sum up the cluster, we named it as the Egocentric Cluster.

DIFFERENCES OF THE IDENTIFIED CLUSTERS

Based on the analysis of the seventeen network pictures from the twelve companies, we found that there are the four divergent clusters in these network pictures, named as the Future oriented cluster, the Broad perspective cluster, the Narrow perspective cluster, and the Egocentric cluster. The finding of the diverging network pictures among the actors in a network is in line with the Ramos and Ford's (2011) finding. However, the finding about divergent network pictures among companies in a focal network is not surprising itself. More interesting is to understand why and how the differences do form. At the following we discuss the divergence between the found network picture clusters. First analyzing the companies and their nature in the identified clusters (Table 3) and secondly analyzing the differences at the network pictures in these clusters.

Table 3. Summary of the identified clusters.

<i>Clusters</i>	<i>Names</i>	<i>Companies</i>	<i>Descriptions</i>
Cluster 1	Future Oriented Cluster	Media company 1 Public sector Telecom operator 1 System integrator 1	<ul style="list-style-type: none"> • Operating in turbulent industries • Actors operating global and national markets • High level of competition nationally and globally
Cluster 2	Broad Perspective Cluster	Device manufacturer Media company 2	<ul style="list-style-type: none"> • Globally operating actors • Main markets not in the country where the MobileTV service is developed • Wide offering
Cluster 3	Narrow Perspective Cluster	Service provider 1 Media company 3 Telecom operator 2	<ul style="list-style-type: none"> • Nationally operating actors • Low level of competition • Relatively stable markets • Mostly owned by the state having strong economical foundation
Cluster 4	Egocentric Cluster	Infrastructure provider System integrator 2 Service provider 2	<ul style="list-style-type: none"> • Low level of national competition • Very strong position in the global markets

First notion when observing the distribution of companies in the clusters is that the industry of companies does not seem to explain the difference in network pictures. Companies from the same industry are dispersed to the separate clusters. For example all the three media companies are dispersed to the three separate clusters. However, network pictures from the representatives of same company are placed in same cluster, for example the four representatives in the Device manufacturer are placed in the Broad perspective cluster.

The companies in the Future oriented cluster are operating in the turbulent industries where for example the cycle of developments is relatively fast. Thus, the proactivity of a company is the natural cause of the requirements that the business environment sets. In addition, the future orientation of the public sector actor in the cluster is expected, since the actor's goal is attempt to anticipate the changes in the environment broader time perspective than individual business companies. The companies in the Broad perspective cluster are globally operating companies, which main markets are not in the country where the MobileTV service is developed. For example at the year 2011 all most 80 per cent of the Device manufacturer's sales came outside of the Europe. Thus, it is natural that, for example Device manufacturer holds broader perspective on the possibilities of the developed service, since its future incomes concerning the service may come from another markets.

The placement of actors in the Narrow perspective cluster is also quite easily explained, although their industries vary quite much. The markets of these actors are in Finland where the MobileTV service is developed. Thus, these companies are not particularly interested about global markets or global players. The companies in the cluster are mostly owned by the state, and thus having strong economical foundation. In addition, the competition in their industries in Finland is quite low and thus the markets are relatively stable. The final cluster, the Egocentric cluster, includes companies with low national competition (Infrastructure provider and Service provider 2) or very strong position in the global markets (System integrator 2). This set up seemed to reflect also to the normativity of actor's perceptions, since all representatives in the cluster had strong normative weight in their network pictures.

The analysis of individual network pictures establishes that the fluctuation in the network picture dimensions varies quite extensively. The differences (see Table 2) were especially related to the dimensions of Normative (2.1), Internal procedures (2.4), Actor specificity (3.3), and Stereotype (4.1). On the other hand, there was no fluctuation in the dimensions of Structuredness (4.3.) and Stasis (4.4). Thus, it seems that these are the most differing and least differing network picture dimensions in the case of MobileTV network. The finding is partially in line with the findings that Ramos and Ford (2011) made, since they found as well that Structuredness and Stasis did not differentiate between actors. However, they also argued that Internal procedures did not differentiate between networks, but the findings of our study points out quite opposite.

To summarize, based on the results of our study, the network conception of the MobileTV network was quite fragmented. There could be identified several substantially differing clusters of network pictures. The substantially high differences between companies seem to be affected to the ability to form a coherent focal network. It seems that, at least in some cases, the actors were directing their actions to different directions misguiding the coherence of the network. For example companies in the Broad perspective cluster wanted to direct the development of MobileTV to compete in global markets, where the companies in the Narrow perspective cluster were only interested about national context. The role of the hub-actor of the focal network was perceived to be substantial in forming the common network conception. At the early phases of the MobileTV case the hub-company was the Device manufacturer. At the later phases the Telecom operator 2 became the hub-company. It is notable that these two actors are in quite opposite clusters identified in the present study, Device manufacturer at the Broad perspective cluster and Telecom operator 2 at the Narrow perspective cluster. Thus, changing the hub-company in the network before forming at least relatively sophisticated conception of the focal network may lead to challenges at the future steps of the network.

CONCLUSIONS

In this study we aimed at explaining why network actors failed to develop a comprehensive appreciation of the service development project from the perspective of network pictures. We found that case network participants had substantially different network pictures. More specifically, we identified four types of clusters. We named the clusters the Future Oriented Cluster, the Broad Perspective Cluster, the Narrow Perspective Cluster, and the Egocentric Cluster. The differences were especially related to following dimensions of network picture (Ramos and Ford, 2011): Normative, Internal procedures, Actor specificity, and

Stereotype. Based on the results of our study these substantially differing network pictures have an effect to the forming a coherent focal network. Thus, it can be argued that the focal network's actors have to amalgamate their network pictures to the focal network-level shared understanding of the network in which the actors of the network are operating. Since identifying the phenomena we suggest the concept of network conception to refer that phenomenon. At the following the idea of network conception is introduced.

THE IDEA OF NETWORK CONCEPTION

The extant research has identified that a person's conclusions, decisions, and actions are affected by cognitive structures. With extensive literature there has evolved several concepts describing the mental structures (e.g. Markus, 1977; Rouse and Morris, 1986; Henneberg, Mouzas, and Naudé, 2006). In addition, the extant literature has recognized organizational-level collective cognitive structures and it has attempted to explain and understand with several concepts (e.g. Cannon-Bowers, Salas, and Converse, 1993; Klimoski and Mohammed, 1994; Mouzas, Henneberg, and Naudé, 2008). The following Table 4 introduces some exemplifying concepts describing cognitive structures at the different levels. More thoroughly made listing for example of the individual-level concepts is made by Henneberg, Mouzas, and Naudé (2006) and organizational-level concepts aggregated by Klimoski and Mohammed (1994).

Table 4. Exemplifying concepts describing individual- and organizational-level cognitive structures.

	<i>Concept</i>	<i>Authors</i>	<i>Definition</i>
<i>Individual-level</i>	Network picture	Henneberg, et al., 2009	The different understanding that players have of the business network in which their focal company is operating
	Mental model	Rouse and Morris, 1986	Mechanism whereby humans generated descriptions of system purpose and form, explanations of system functioning and observed system states, and predictions of future system states
	Schema	Markus, 1977	The dynamic, cognitive knowledge structures regarding specific concepts, entities, and events used by individuals to encode and represent incoming information efficiently
	Cognitive map	Fiol and Huff, 1992	Graphic representations that locate people in relation to their information environments
	Belief systems	Rokeach, 1960	The belief system is conceived to represent all the beliefs, sets, expectancies, or hypotheses, conscious or unconscious, that a person at a given time accepts as true of the world he lives in
<i>Organizational-level</i>	Network insight	Mouzas et al., 2008	The outcome of continuous and iterative interplay between the factual physical and social artifacts that surround actors in networks of exchange relationships as well as the cognitive schemata constructed and shaped from actors' past experience and precedents
	Shared mental models	Cannon-Bowers et al., 1993	Cognitive representations of task requirements, procedures and role responsibilities that members hold in common
	Collective efficacy	Lindsley et al., 1994	The group's collective belief that it can successfully perform a specific task
	Team mental model	Klimoski and Mohammed, 1994	Organized mental representations of the key elements within a team's relevant environment that are shared across team members
	Collective cognitive map	Axelrod, 1976	Beliefs and assertions of individuals aggregate
	Organizational schemata	Bartunek and Moch, 1987	A common orientation towards events
	Social cognition	Larson and Christensen, 1993	Social process that relate to the acquisition, storage, transmission, manipulation, use of information for purpose of creating a group-level intellectual product
	Dominant logic	Prahalad and Bettis, 1986	Mind set conceptualization of the business tools which is stored as a shared cognitive map
	Collective mind	Weick and Roberts, 1993	A pattern of heedful interrelations of actions in a social system

Individual- and organizational-level cognitive structures are approached and conceptualized by various means. However, the extant research does not seem to recognize network-level collective cognitive structures for example as in the case of MobileTV development network. However the variation on the network pictures among the participants of the MobileTV network seems to affect success of the network. Thus, we suggest the concept of network conception to illustrate the phenomenon.

The extant literature on the organizational-level (or group-level) discusses the collective cognitive structures, but the focus seems to be on intra-organizational actors forming a team or a group. The literature does not make a difference between the intra-organizational groups and the inter-organizational groups (see Table 4). However, collective cognitive structures at the intra-organizational-level and inter-organizational-level are quite different. In intra-organizational setting the management of the organization can autonomously control for example their meetings, regulations, task rotation, employment and discharging. According to Louis (1980) a company may speed and course the development of the collective cognitive structure by self selecting participants of the group. In addition, Klimoski and Mohammed (1994) approach the phenomenon with the concept of team mental model and note that a company may control the development of team's mental model with personnel rotation.

In the intra-organizational-level and more broadly in the focal network-level setting those same controlling mechanisms are not possible since all actors cannot be controlled by a single company. Those actors are controlled each by their own company management. For example in the case of MobileTV development network, there were twelve companies. Actors in these companies cannot be controlled autonomously by single company in that network. Thus, building the collective cognitive structures at the focal network-level is based on different rules and possibilities. Concluding this, these two levels of collective cognitive structures should be distinguished to the intra-organizational-level and the focal network-level collective cognitive structures. Thus at the present study we suggest the concept of network conception to refer the shared understanding of the actors of the focal business network in which the actors are operating.

The suggested definition of the network conception is a nominal definition that links the concept to the empirical world that is argued to be crucial to the development of science (Zaltman, Pinson, and Angelmar, 1973). In that sense the concept offers a ground to further study the network-level collective cognitive structures based on the industrial network approach. In addition, the present study extends the perspectives of network pictures and network insights to the network conception, by grounding to the same literature.

The present study contributes to the research on collective cognitive structures (e.g. Axelrod, 1976; Prahalad and Bettis, 1986; Fiol and Huff, 1992; Levine et al., 1993; Klimovski and Mohammed, 1994; Bettis and Prahalad, 1995; Gary and Wood, 2011) by extending the understanding of individual-level (e.g. Rouse and Morris, 1986; Ford et al., 2003; Henneberg, Mouzas, and Naudé, 2006; Geiger and Finch, 2010; Corsaro et al., 2011) and organizational-level (Cannon-Bowers, Salas and Converse 1993; Klimoski and Mohammed, 1994; Mouzas, Henneberg, and Naudé, 2008) cognitive structure to the focal network-level collective cognitive structures. In addition, the study suggests the concept of network conception to stand for the focal network-level shared understanding of the network.

In this study, we utilized the tool introduced by Ramos and Ford (2011) The study only partially validates the tool, since not all dimensions of network pictures were found to

differentiate the network pictures. However, it seems that the type of the network affects to the weighting of the network picture dimensions. Ramos and Ford (2011) studied exchange networks (long-term and short-term) whereas our study focused on service development network creating a market where to operate and compete in the future. By doing this, the study has a slight contribution to the literature stream in which network pictures are utilized as a research device (Leek and Mason, 2010; Ramos and Ford, 2011).

Beyond the theoretical contributions of our research, there exist managerial implications as well. For managers, the study offers an insight into the diversity of the understandings that the players of network have. As the studied case indicates this diversity have substantial effects to the coherence of network. The role of the hub-company in that network seems to be substantial. Besides amalgamating network pictures in their own companies, managers in the hub-company may also assess and develop the commonality of network conception in the focal network they are involved. The assessment may be implemented by using the tool to capture actors' perceptions introduced by Ramos and Ford (2011). With the results of the assessment managers may direct their attempts to co-develop an amalgamated network conception. Based on the previous findings of amalgamating network pictures to organizations network insight (Mouzas, Henneberg, and Naudé, 2008), multiplenegotiations and heedful interactions at numerous differing levels within and between organizations are needed to develop network conception.

LIMITATIONS AND FUTURE AVENUES

The conclusions of the present study must be treated with care, since they are based on a single case network representing specific companies and market characteristics. In addition, from the most of the companies there was only one representative to illustrate the company's perception of the network. Thus, these representatives only illustrated the company's network insight. However, the study does not aim for statistical generalization based on hypothesis testing, but attempts to build theory for further study (Eisenhardt, 1989). The identified cluster are not argued to be stable in all contexts, but rather the study illustrates that the existence of different type of clusters affects to the coherence of the focal network as a whole, and thus the issue is relevant for further study.

The present study opens various future research avenues from which some are introduced here. *Firstly*, the network conception concept share similar features with the concept of network insight (Mouzas, Henneberg, and Naudé, 2008), since network insight are amalgamated from network pictures to the organizations' shared insights. Thus, it may argued that network conceptions are also formed on these network insights. Although there seems to be a link between these concepts, the relation of these concepts must be identified. *Secondly*, the present study does not offer profound understanding of the concept of network conception, but it suggests a concept to describe the identified phenomenon. In future studies scholars may scrutinize the network conception by studying, for example what is the role of organization boundaries in amalgamating the network conception, and how these boundaries differentiate the concept from the concept of network insight. *Thirdly* and perhaps the most importantly, more evidence of network conception need to be collected in a systematic and possibly longitudinal fashion. For capturing individual network pictures of the representatives of companies, the tool developed by Ramos and Ford (2011) seems to be a suitable one. To sum up, research on network-level social cognition seems to offer fruitful future research field that have substantial practical relevance.

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APPENDIX 1. Definition of network pictures dimensions (adopted Ramos and Ford, 2011).

Dimensional Group 1. Focus	1.1 Actors	Characterizes an actor view with regard to his/her perception on who the 'focal' actor or groups of actors in the MobileTV development network is/are	1.1.1 On Themselves 1.1.2 On the Company 1.1.3 On the Surroundings	
	1.2. Processes	It is about the element(s) of relationships that an actor thinks more intensively about	1.2.1 On Actor Bonds 1.2.2 On Activity Links 1.2.3 On Resource Ties	
	1.3 Actors/Processes	Reflects whether an actor perceives the surroundings network as a set of relevant actors or/and in terms of relationships between those actors	1.3.1 On Actors 1.3.2 On Relationships	
	1.4 Actors' features	It is related to those structural features of the surrounding actors that an actor thinks more intensively about	1.4.1 On Actors' Resources 1.4.2 On Actors' Problems 1.4.3 On Actors' Aspirations	
	1.5 Time span	It addresses which distinct periods of time an actor thinks more intensively about	1.5.1 On Past Events 1.5.2 On Present Events 1.5.3 On Future Events	
	1.6 Function	Reflects whether an actor thinks in terms of a particular departmental function or not, and if so, in the terms associated to his/her current function or if in terms of others' functions.	1.6.1 On Own Function 1.6.2 On Others' Function	
	Dimensional Group 2. Weight	2.1 Normative	Allows characterizing actor perceptions in terms of whether he/she knows what should or should not be done so that success can be achieved in MobileTV case	2.1.1 Normative Weight 2.1.2 Non-Normative Weight
		2.2 Moral	It is about whether there is a moral philosophy underpinning the way an actor perceives the world	2.2.1 Sense of Should 2.2.2 Just a View
		2.3 Knowing What is going on	Reflects if an actor considers it to be important or not to be aware of what is taking place in the surroundings, no matter how much it is related to his/her activity	2.3.1 Important Knowing What is Going On 2.3.2 Not Important Knowing What is Going On
		2.4 Internal Procedures	Addresses the extent to which an actor considers important knowing about actors' internal processes	2.4.1 Relevance of Internal Procedures
Dimensional Group 3. Specificity/Coherence		3.1 Coherence with Board Identity	Reflects whether an actor agrees with the principles that his/her company's board explicitly states for the organization	3.1.1 Coherence with the Board's Explicit Identity 3.1.2 Non-Coherence with the Board's Explicit Identity
	3.2 Situation Specificity	It is about the extent of detail to which an actor thinks about situations	3.2.1 General Situations 3.2.2 Specific Situations	
	3.3 Actor Specificity	Reflects the extent of detail to which an actor thinks about actors	3.3.1 Groups of Actors 3.3.2 Specific actors	
	Dimensional Group 4. Overall view of surroundings	4.1 Stereotype	Characterizes the view held by an actor that he/she uses to represent the MobileTV case	4.1.1 A Network 4.1.2 A Supply Chain or Other
4.2 Consistency		Reflects if an actor sees things in a more or less comprehensively coherent way	4.2.1 Consistency 4.2.2 In Conflict	
4.3 Structuredness		It is about whether an actor perceives the world in a more or less structured and organized way	4.3.1 Structured 4.3.2 Unstructured	
4.4 Stasis		It is associated with the extent of dynamism that an actor perceives	4.4.1 Evolving 4.4.2 Static	
4.5 Broadness		Characterizes an actor view with regards to the scope of his/her perception of the surrounding network	4.5.1 Broad 4.5.2 Narrow	
4.6		It is about the extent of specificity associated with an actor view of the surrounding network	4.6.1 Comprehensive 4.6.2 Non-Comprehensive	
4.7		Characterizes an actor view in terms of whether he/she sees the surrounding in terms of conflict/collaboration situations	4.7.1 Power / Conflict 4.7.2 Collaboration	
4.8 Actors as Providers		Defines how an actor perceives the surrounding actors in term of services provided	4.8.1 Customized Offers 4.8.2 Standardized Offers	