Making Sense of Network Dynamics through Network Picturing

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Introduction of the problem

Constant change is often seen as the main challenge facing firms in today's economy, and therefore research interest has also focused on the types of networks that enable dynamics (e.g., agility, renewal, and even exploration of new business opportunities). When approaching networks as systems including several sub-systems as described in the introduction of this book, it can be understood how the future structure and paths of dynamic business network development are fundamentally unknowable. It is because they are co-produced through interactions within the sub-systems and not traceable in any simple way to the individual actions of the participants. The managerial challenge is to guide the development within a business network over the boundaries of organizations. Thus, practical tools are needed to better understand how actors' network strategies actually come into being in continuous interaction between the organizations. In line with earlier studies of *strategy-as-practice* research, this chapter reflects utilization of strategy tools and how they facilitate the work of strategists (e.g. Kaplan, 2011; Jarzabkowski et al., 2013).

The network picturing tool extends our understanding of strategic management in dynamic business networks. We explicate this through two cases. In the first case study, we showcase how network picturing helps in recognizing alternative network trajectories and to develop value propositions that are beneficial to the network, to the dominant actors, to the ones serving the dominant actors, and to those who are challenging the status quo. The second case study focuses on the downstream (demand) dimension of business networks, including from the perspectives of sales, distribution, after-sales, and service networks. In the context of a business network, each of these actors has its own perception of the network and its position within it. In a way, network pictures are the actor's *network theory*, its individual beliefs (theories in use) of what the relevant business network looks like and how it "works." In practice, this is one of the reasons why attempts to manage a network often fail or create no response, while actors have not considered the interests of other parties. Therefore, drawing from the management point of view, the network picturing tool aims to support managers in making sense: how can they picture and combine the different network perspectives in order to better manage the network?

Background of network pictures as a sense-making tool

Networks are multilevel systems. According to Moliterno and Mahony (2010), network theory of the organization should therefore be multilevel in its scope, considering how networks at one level of the organizational system influence networks at higher and/or lower levels. In order to manage actors and their activities within the network-system level, managers need to understand the perceptions and interests the other actors have (Valkokari 2015). In addition to joint business activities and strategic intents, managers should make sense of the evolving and dynamic nature of networks. Thus, the network dynamics consist of a complex pattern of activities, both intentional and emerging. Emerging from these activities and interactions between the business network actors are the network-system level dynamics that we can observe as changes in the network's characteristics (i.e., in structures, relationships, actors, and roles of actors) (Valkokari 2015).

In the IMP literature, *network pictures* have been defined as business actors' subjective

mental representations (or frameworks) of their surroundings, and thus as sense-making tools that underlie decision-making in networks (Mattsson 2002; Ford, Gadde, Häkansson, and Snehota 2003). They have also been used as a tool by either researchers or practitioners to grasp the actors' understanding of their surrounding business network (Henneberg et al. 2009; Ramos and Ford 2010). Furthermore, Laari-Salmela et al. (2015) state how an interesting topic for research includes opening up the relationship between network pictures and the sense-making taking place between organizations. In such cases, network pictures can be utilized as *boundary spanning mechanisms* (Hawkins and Rezazade 2012), which serve as an interface between different organizations (Koskinen and Mäkinen 2009). Network pictures are particularly useful in revealing both multi-level structures as wells as processual realm thus enabling sense-making of a changing network (Kaartemo, Makkonen, and Olkkonen 2015).

The network actors build a shared understanding about the network's strategic intent through formal business negotiations as well as informal interactions (Valkokari 2015). Thus, the managers' understanding of perceptions across boundaries is a key to firm success in complex business environments, where knowledge and resources are dispersed and value co-creation for customers requires integration of resources. In other words, network management requires understanding of networks as a system and furthermore getting a clear picture of the different mechanisms within this system.

Network picturing tool

The network picturing tool builds on the assumption that through understanding relationships, activities, and interactions between network members, the development path of networks can be managed and guided by influencing other network actors. As mentioned in the introduction (chapter 1) this kind of boundary-spanning *network leadership* is the common activity of all network actors that affects the development of social capital, i.e. *networks-as-coordinated social systems*. Thus, a careful review of a firm's own position among the networks as well as different networking directions offers managers new *theories in use*, how their business networks will currently operate or how they should look in the future. In other words, network pictures are strategic sense-making tools that can be utilised in shaping stability and change in business networks. Firms are simultaneously acting in various networks in different roles as illustrated in Figure 4.1.

Often, companies anchor themselves to a single vision of their customer needs and network structures, which may preclude considering the viewpoints of other network actors. Many businesses have a complex nature, and **network picturing makes it possible to see beyond the most obvious and traditionally proximate actors.** In other words, missing links between the actors and structural holes are also considered within network picturing. Managers who understand the different forms of inter-organizational relationships are also able to manage their dynamics and consequential uncertainty better, while they are more aware of the choices and decisions of others and their influence to the game as a whole.

Figure 4.1. Network picturing tool.
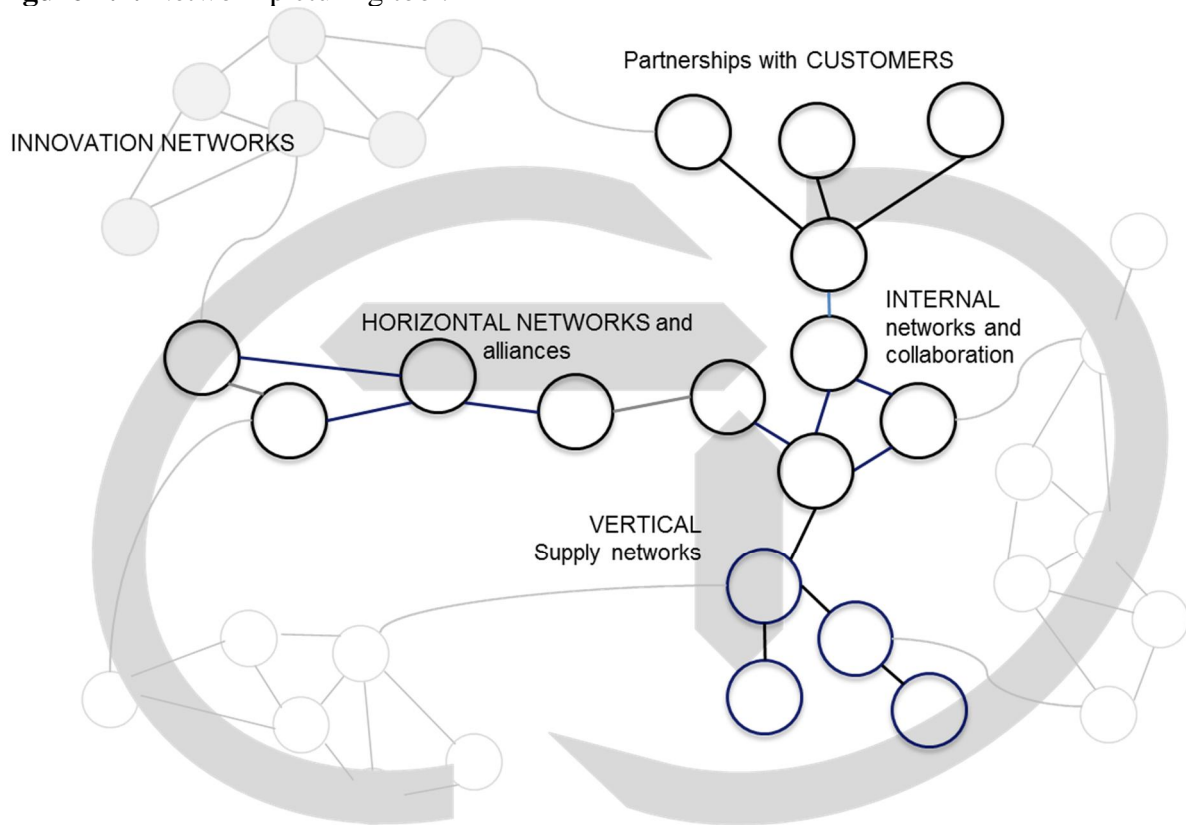
The focus of **vertical customer–supplier networks** and relationships is, by definition, typically to supply present products. Joint operations are usually managed in direct business relationships and through formal governance mechanisms like agreements. Naturally, customers are important sources of knowledge about needs, requirements, wants, and ideas that are crucial for developing new offerings that meet market demand. On the other hand, in addition to direct supply in the form of products or resources, there is a range of intangible knowledge such as reputation, network connections, and experiences which are important to business development. In customer-supplier collaboration, the vertical relationship often guides the actors toward a one-track mindset of action, where the customer is a major player and the supplier an object of the action. In such relationships, the feed-back loops and bi-directional interaction are often missing. For smaller supplier companies especially, the claim for and protection of their rights in relationships with larger customers is typically inconvenient.

Horizontal development networks and alliances cover different direct and indirect relationships with other companies, consultants, and regional development agencies. The focus is, for instance, on development learning, benchmarking, or joint activities in limited areas like research, marketing, or export. Thus, horizontal relationships may counterpoint equality between the actors, and thereby overlook the need for vision and mechanisms for decision-making and management of the operations. Universities, research centers, innovation inter-mediators, and funding agencies act as important sources of knowledge about information, technology, and finance for the innovation process within **innovation networks**. In such co-operation settings, the similarity between knowledge bases as well as network positions have a significant influence on the possibilities and willingness to share or transfer knowledge.

In practice, network management is typically disturbed in different operational units within one firm and the focus of network management differs in each dimension. Thus, there are two basic purposes for the various forms of inter-organizational relationships, i.e. co-exploration and co-exploitation (Parmigiani and Rivera-Santos 2011). In line with that our framework distinguished (see Chapter 1) network practices, networks-as-knowledge-creating platforms (co-exploration) and Networks-as-value-generating entities (co-exploitation). The exploration of new ideas for innovation and the exploitation of present knowledge to develop their offerings require firms to integrate different knowledge sources and network actors into their dynamic business development. On the other hand, the exploitation requires coordination of the networks' resources into effective value joint generation. It is important to note that besides formal observable business relationships, there are less noticeable informal relationships between the actors—and these social networks and interconnections may be an even more efficient way to find new solutions and fill structural holes within network operations.

Network dynamics and timing pose challenges to management; network actors can have different perceptions of how the network should work, what its interests should be, and why they are participating. For instance, one of the network actors might consider the objective to be the exploration of new knowledge and future business opportunities, while others operate within the present business model and expect that the benefits will materialize faster. The role and network position of the firm are critical factors in the selection of suitable methods for network development and management. The choices and decisions of network actors can be perceived only when managers have an understanding about their development agenda and strategic targets.

Furthermore, it is important to evaluate the network pictures (i.e., actors, their targets, and relationships between them) regularly. While firms are sold and bought and the strategies change, this causes changes at the network-system level. The scenarios of different value propositions can help to foresee the development paths of networks. In the following we present two cases which showcase how network picturing may be used for envisioning and driving changes in networks.

Network picturing as a tool to envision network change by a multinational company

The first case company is a large multinational company (MNC) that designs and supplies cargo systems for global container shipping industry. The main customers are Asian shipyards. The company has decades of history in serving container shipyards. The case company gave up manufacturing already in early 1990's and has since then delivered cargo handling systems manufactured by their suppliers. In the aftermath of the financial crisis in 2008, the market for new container ships diminished drastically. In order to survive in the challenging market condition, the case company created new solutions team which questioned the reliance on shipyards as customers and started portraying its network from a novel angle.

In the following, we present how network picturing was employed to help developing value propositions for multiple actors under alternative scenarios, which were identified in workshops with the case company managers. There is an extensive amount of literature on and around scenario workshops (Miesing and Van Ness 2007), and therefore we do not go into detail on running the workshops here. Instead, we focus on the unique part of the

process, namely the development of value propositions for multiple actors under alternative network scenarios.

Figure 4.2. The process of developing value propositions to multiple actors under alternative network scenarios.
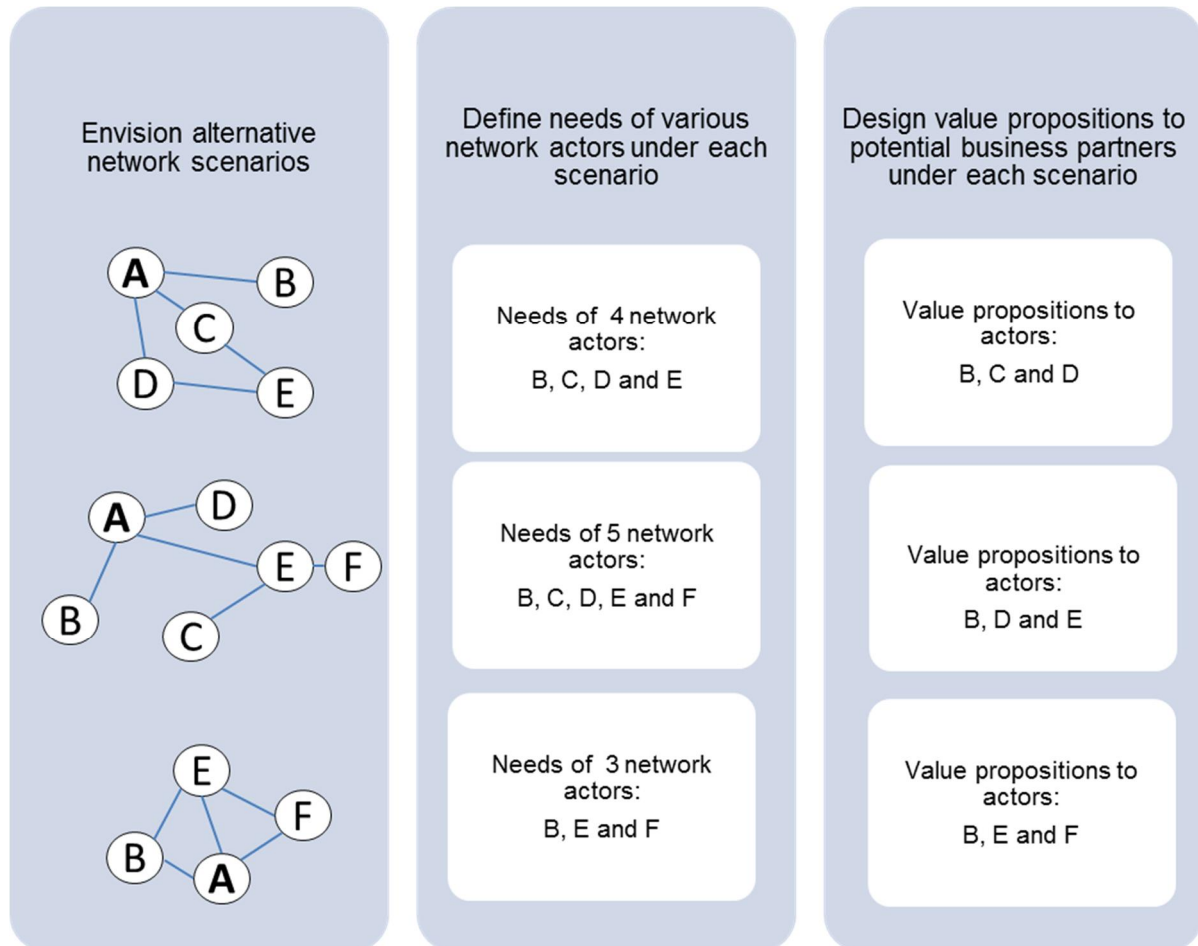
First, in our two workshops, we envisioned multiple network scenarios about how the future might evolve for global container shipping, and we discussed the potential role of the focal company under each scenario. We ended up describing alternative scenarios in terms of the dominance of different actors (A, B and D) and spent some time imagining what kinds of network practices might be characteristic to these scenarios.

Second, in order to define the needs of various actors under each scenario, we ran another workshop. Starting with pre-defined scenarios and related network practices, we asked case company managers about the basic network principles: 1) What is needed by the dominant actor in the given scenario? 2) What is the position of the other actors? As a result, we were able to identify not only the needs of the dominant actor but also the needs of those serving the dominant actors and those willing to challenge the dominant actor under each network scenario. Based on the discussion in the workshop, the researchers drew network pictures that visualized the roles of each actor under each scenario.

Third, we initiated a discussion on what kind of value the focal company could propose to each actor under each scenario. This gives guidance to the focal company in determining

what kinds of capabilities are needed in-house in the future. In addition, drafted value propositions should also initiate internal processes in the R&D department to launch research and development that enables the proposition of value to various actors in the future. Thus, the exercise helps the company tackle the changes in the network.

In our workshop, the consensus was that our focal company would prefer two scenarios over one, and therefore it was deemed necessary to drive the network toward desired future. In addition to designing value propositions that may be attractive a decade from now, the method also facilitated discussion about potential activities that the focal company could perform in order to guide the network development toward a preferable future. Thus, it is also useful for deciding upon more short-term development projects.

The discussion further highlighted the importance of understanding customer problems and providing solutions for them. Employing the method enabled the focal company to focus not only on one solution approach to one customer segment, but also broadened the horizon for long-term value proposition development for multiple actors. Moreover, the network picturing workshops initiated discussion on how the focal company could communicate its network proposition (i.e., what the focal company does to improve the viability of the ecosystem; proposing value that is beneficial for multiple actors). Furthermore, the method is useful not only for imagining different situations, but for considering early on what kind of value could be proposed to network actors when actual events indicate that one scenario is becoming more likely than the others.

Network picturing as a tool to drive network change by an SME

The second case company is an SME that develops and manufactures machines for construction, multi-purpose machines, and utility machines for demanding applications. The main market area of the company is the Nordic region, where the typical customer is a privately owned SME or an entrepreneur. The company has a strong history in development and manufacturing; previously sales and service functions were responsibilities of a specialized partner company. Due to changes in the market, the case company started to build its own sales and service organization and downstream network seven years ago.

In our second case study, we utilized network picturing as a tool for strategic management in the case company. We first drew two focal company perspectives, factory (Figure 4.3a) and sales (Figure 4.3b), identified their most important connections, and described the roles and content of interaction with these first-level partners.

Figures 4.3a and 4.3b. Network from factory and sales perspectives.
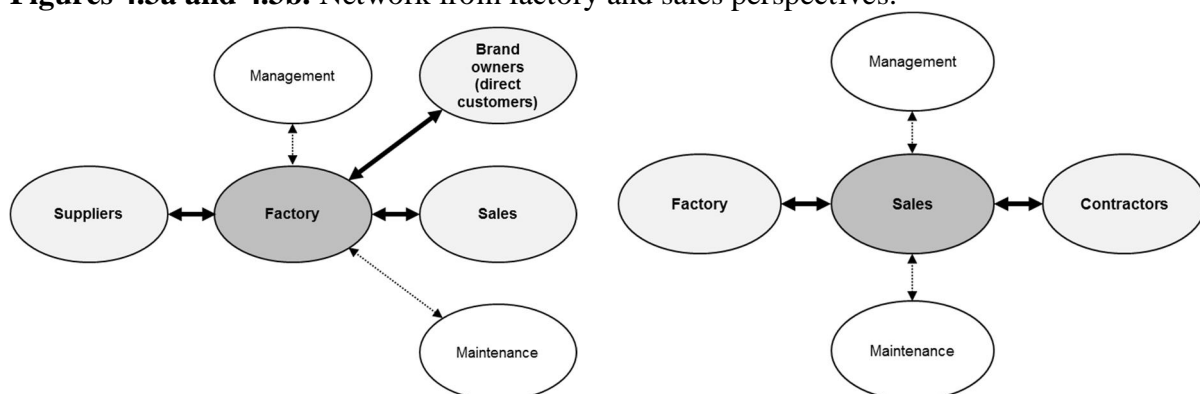
The managing director and the main owner of company is responsible for strategic-level issues, but the operations are run by the factory director, so they were the key actors whose network pictures were considered. Sales representatives are responsible for sales and customer relationships in certain geographical areas. Most of them have a long history and experience in the industry, thus knowing their traditional customer base, competitors, and the machines they sell. There are loyal customers in each area that ideate new solutions and applications for the machinery in order to enhance their businesses. The machines are customized, and dealing with the versatile customer requirements and requests are the motivation of the regular communication between the sales and the product development and production. Also, the tenders and order-to-delivery process require cooperation. The company has built a maintenance network in the field, but the sales representative is often the first contact concerning repair or maintenance.

The broader network perspectives of the two "end-customers" were sought in application areas where the machines of the case company are used (Figures 4.3c and 4.3d). These network pictures, snapshots from different network actors' perspectives, were then utilized to draw the network management perspective. The first end-customer is a public service provider operating in one large city. The other end-customer perspective is from a private sector service provider specializing in power network services (e.g., designing and building wind farms). The main collaboration partners of both end-customers were their own customers and the parallel actors (i.e., other public service providers for the first, and other large contractors in joint projects for the second). The end-customer views of the network and their own non-existent role in those pictures was eye-opening for the case company.

Figures 4.3c and 4.3d. Networks from different customers' perspectives.
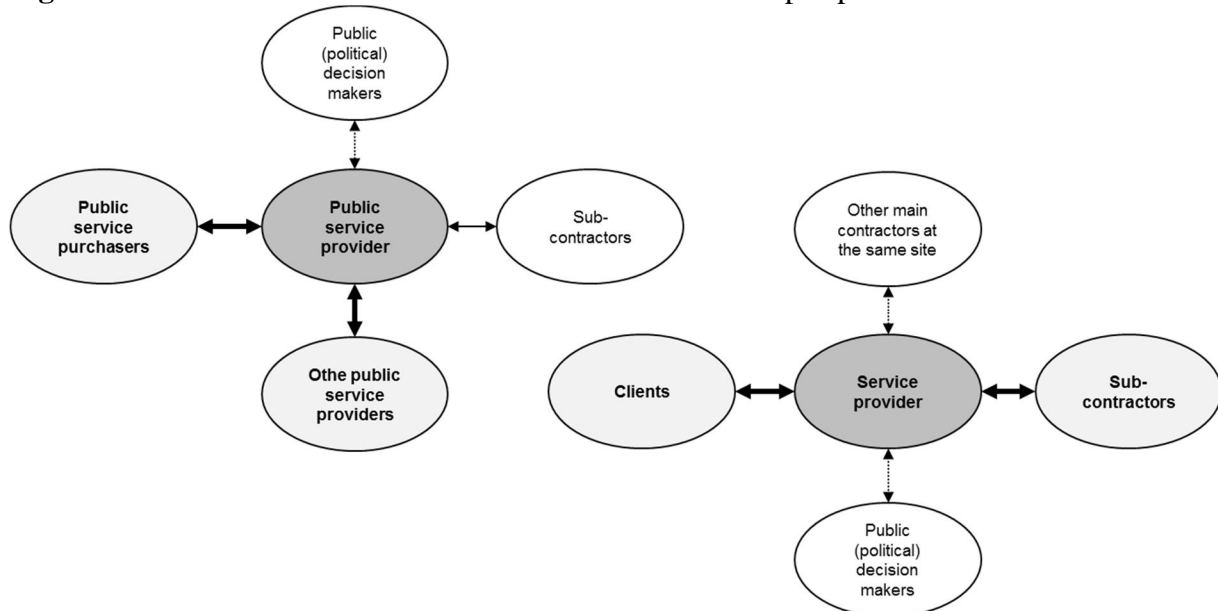
Network picturing resulted in the identification of new relevant network actors and the needs for building connections to them (Figure 4.4). *The strategic aim of the case company management is to act as a driver of change to guide the industry in the direction they believe is profitable to them and also to the other relevant network actors (service purchasers, service providers, and contractors).* Their vision is that the mobile multi-purpose machinery they offer is more productive and environmentally friendly than other solutions. Traditional methods and approaches still dominate at work sites and sub-optimization is common. The

current focus of sales is to their direct customers, the contractors. This is a slow bottom-up approach for change: the contractors work and market their versatile machines to service providers. Thus, our case study suggests that different network picturing tools can be utilized as a means of transformation in companies seeking growth in new markets and internationalization.

Figure 4.4. Network from SME management perspective.
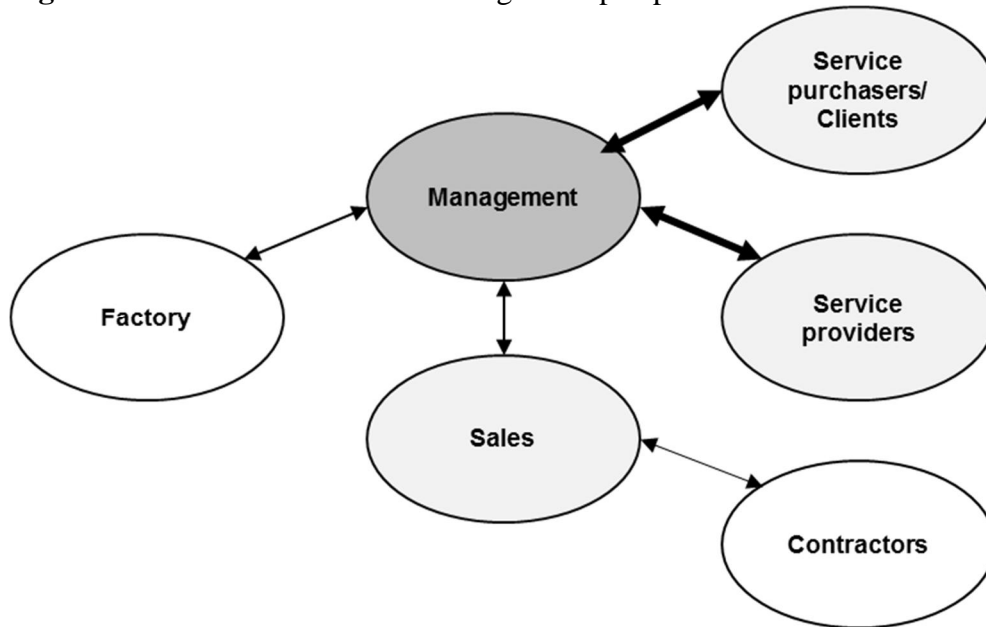
Conclusions

Although no firms are in such a position that they could manage the whole network system, every firm, MNC or SME, is able to manage its own position and role within their networked environment. This requires systematic and strategic analyses of the network environment, its actors, and their targets. In this book chapter, we showcase how network picturing may be utilized in sense-making network dynamics and associated needs of various network actors. Based on these analyses, firms are able to make more conscious decisions, take calculated risks, and leap at emerging opportunities by making explicit the potentially beneficial value propositions that would otherwise remain hidden. Thus, we explicate that network picturing is particularly beneficial in envisioning and driving change in business networks. Naturally, the strategic analyses of networked business environments are challenging and time-consuming, thereby requiring more open dialogue between different units of the firm as well as with network actors. Visualization of networks through simple pictures can anyhow provide a helpful tool for such discussion and support managers in sharing their own *network theories in use*. To sum up, the workshop process included the following key questions: 1) Where are we now and in the future (strategic positioning)?, 2) What are our targets and where do we want to go (vision)? and 3) With whom and how do we get there (strategic change and required network relationships)?.

This chapter contributes to the emerging *networks-as-practice* research by describing the sense-making tool and the relevant workshop process. Originally Jarzabkowski and Seidl (2008) had discussed the role of meetings in the social practice theory and defined three

critical aspects of those strategic episodes in meetings: initiation, conduct and termination. The workshops facilitated utilization of network picturing as a strategy tool and supported the interaction of strategists' in dynamic business network setting. Strategic discussion in the workshop meetings socially validated the current order and served as a place for participants' sense-making (Weick 1995). On the other hand, through network picturing the strategist explored and generated change in their shared strategic orientations over boundaries of a company or its units. Our cases brought out three workshop praxis that can support critical aspects of the strategic meetings: initiation, conduct and termination. First, for initiation it is important to have quite open and informal agenda, in order to allow organizational members to step out of their daily routines, to reflect on them and based on that, to propose variations to the existing strategic orientations. Second, for conduct researchers' active role in guiding the workshop supported open discussion and joint problem solving. Third, for termination visualization of network picture enabled to re-couple the workshop results, i.e. the abstract network theories in use, to the outside processes in the daily routines of workshop participants.

In a dynamic environment it is necessary to constantly reflect one's value propositions against the development of the network. This is the only way to ensure that value propositions are appealing to those in power and that they serve the dominant players, or alternatively that they help the challengers to break the status quo. Here, it is important that a company identifies certain events that are needed for the scenario to actualize. Therefore, as a managerial implication we suggest companies to run network picturing workshops on a regular basis.

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