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Choosing the Right Network Strategy to Manage Exploration Processes

ANNETTE BIEDERMANN
RUDI K. F. BRESSER
REYNALDO VALLE THIELE

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Annette Biedermann
Free University of Berlin, Department of Business Administration, Berlin, Germany
Garystrasse 21, 14195 Berlin, Germany
e-mail: an.biedermann@gmx.de

Rudi K. F. Bresser
Free University of Berlin, Department of Business Administration, Berlin, Germany
Garystrasse 21, 14195 Berlin, Germany
tel.: +49-30-8385-4055, e-mail: bresser@wiwiss.fu-berlin.de

Reynaldo Valle Thiele
Free University of Berlin, Department of Business Administration, Berlin, Germany
Garystr. 21, 14195 Berlin, Germany
tel.: +49-30-8385-5549, e-mail: reyvalle@wiwiss.fu-berlin.de

ABSTRACT

We develop a social capital model that explains how networks of interorganizational relationships can be structured to manage exploration processes directed at gaining competitive advantage in different environmental contexts. We argue that a network structure of low density and high strength of relationships is beneficial if the main goal of the network is to actively configure the environment, e.g. under conditions of high environmental complexity. In contrast, a network structure of high density and low strength of relationships is advantageous if the adaptation to changing environmental conditions is the main concern of the embedded organizations, e. g., in contexts characterized by high environmental variability.

Keywords: Social capital, networks of interorganizational relationships, network strategy, exploration

INTRODUCTION

Organizations do not act in isolation. They are embedded into complex networks of interorganizational relationships. These networks are potentially valuable resources and, therefore, can be used to attain competitive advantage (Anand et al. 2003; Dyer/Nobeoka 2000). When focusing on social relationships, the concept of social capital[1] is an excellent starting point for analyzing networks of interorganizational relationships in a strategic context. To date, research on social aspects of interorganizational relationships has been conducted only sporadically (Arino et al. 2001; Kale et al. 2000). There is neither a coherent model of social capital nor a comprehensive set of measures and performance indicators for systematically explaining the interdependencies between networks of interorganizational relationships and the potential for gaining competitive advantage.

In the following, a social capital model will be developed that aims at explaining these interdependencies. With regard to different environmental contexts, it will be shown how networks of interorganizational relationships need to be structured for managing the exploration process of embedded organizations in order to gain competitive advantage (Biedermann 2007).

MODELING SOCIAL CAPITAL

A strategically relevant social capital model needs to consider three interrelated dimensions or, correspondingly, three levels of analysis that are referred to as fundamental in the strategic management literature: process, content and context (Pettigrew 1987; Mintzberg 1990; Montgomery et al. 1989). The **process** focuses on the development and maintenance of networks of interorganizational relationships and, therefore, the resulting social capital for the embedded organizations. The **content** explains the generation of different resource endowments that can be attained through networks of interorganizational relationships. The **context** relates to organizational and environmental conditions that influence network processes, and indirectly, content. In addition, a social capital model must include two further levels of analysis: the **organization** and the **network**. Subsequently, only the specification of

[1] Social capital describes the network of social relationships and connectivities that actors possess (Leenders/Gabbay 1999). The success of actors in social systems is closely related to the ability of building, maintaining, and extending relationships with other actors (Tymon/Stumpf 2003).

the **network level** will be considered because the focus of our paper is on networks of inter-organizational relationships. The subject of investigation can be modeled as follows (Fig. 1):

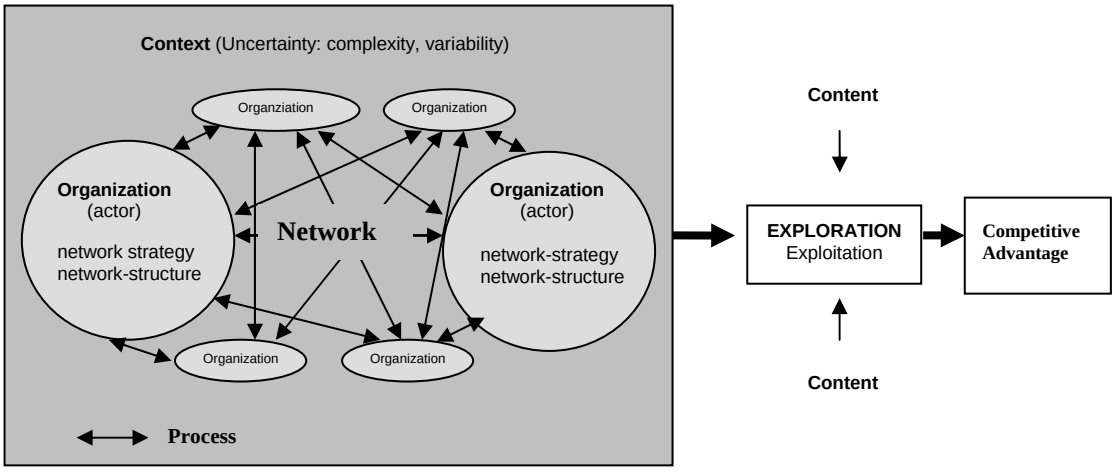

Figure 1: A social capital model of competitive advantage

Characterizing the content and the process

By integrating the **content** of relationships within network processes the following question is addressed: What goals can be achieved through networks of interorganizational relationships? A distinction can be made between two fundamental contents: On the one hand, a **renewal** of the network organizations` resource base may be required leading to comprehensive changes in content, e.g., in existing processes and products. On the other hand, the **maintenance** of the existing resource base may be important, in which case only incremental changes of the existing processes or products may be necessary. Accordingly, a differentiation between two archetypes of goal attainment is possible: maintenance or renewal of the existing resource base.

The content of relationships determines what activities should be pursued in order to maintain or develop the resource base of the embedded network organizations. In this context, it is useful to draw on the distinction between **processes** of **exploration,** i.e., renewal, and **exploitation**, i.e., maintenance (Holland 1975; March 1991). Exploitation can be characterized as learning by routines, i.e., the knowledge base and the capabilities of organizations are gradually enlarged without fundamental changes in existing routines. In contrast, exploration implies continuous renewal of resources, capabilities, and technologies by challenging existing routines (March 1991). Managing the relationship between

exploration and exploitation is crucial for the development of the resource base of organizations and networks (Lewin et al. 1999). Exploration (e.g., investing in new competencies and products) and exploitation (e.g., tapping the full potential of existing competencies) need to be balanced to allow for an effective long-term development of organizations. The following sections focus exclusively on **exploration** because the optimal structure of networks of interorganizational relationships has only been insufficiently analyzed in the literature with regard to processes of exploration.

Characterizing the context and the network

The embeddedness of organizations into their environment (**context**) highlights the influence of institutions on the formation and preservation of networks of interorganizational relationships (Granovetter 1985; Grandori/Soda 1995).[2] Processes of institutionalization show that institutions are subject to continuous change (Nelson/Sampat 2001). Thus, our model is based on general characteristics of the institutional environment that are subject to change rather than specific types of institutions. These general characteristics are environmental **complexity** and **variability**. Due to its complexity and variability, the institutional environment causes different degrees of decision-making uncertainty (Pennings 1981). Complexity refers to the number and heterogeneity of potential actors in the environment (Eigen 1983). Variability is associated with the frequency of changes in the institutional environment (e.g., changes in demand, or in technology).

Two dimensions of the **network** structure are important for the development and analysis of different networks of interorganizational relationships (Knoke 1999): **Density** is a key concept to understand the functioning and success of networks of interorganizational relationships. It is defined as the ratio of existing relations to the potential total number of relations in a network. High values on this ratio correspond to high density. The **strength of relationships** can be considered *strong* (high strength) or *weak* (low strength) depending on the combination of three constituting dimensions: durability, frequency, and reciprocal trust between the actors (Granovetter 1973). "*Strong ties*" as opposed to "*weak ties"* are characterized by high durability and high frequency. They are caused and maintained by relational trust and standards of mutual goal attainment (reciprocity) (Lesser 2000).

[2] Institutions are defined as sets of common habits, routines, and established practices that condition the relations and interactions between individuals and groups (Edquist/Johnson 1997).

Our understanding of an optimal design of the network structure benefits from a more elaborate analysis of the density and the strength of relationships. To this end differentiating between **cognitive variety** and **cognitive distance** is useful. Cognitive variety refers to the extent to which different cognitive frameworks are available, e.g., different interpretation schemes, narratives, etc., that are present in networks of interorganizational relationships (Boje 1991). Cognitive distance refers to the dissimilarities between these frameworks. Thus, the analysis of cognitive distance is related to the concept of absorptive capacity[3]. With an increasing cognitive distance, i.e., dissimilarity of cognitive frameworks, the absorptive capacity within a network decreases, i.e., the receptiveness for new information and the transformation into knowledge are constrained. The capacity to learn and the exchange of resources decreases with an increasing distance between cognitive frameworks (Hamel 1991, Lane/Lubatkin 1998; Mowery et al. 1996). However, with increasing cognitive distance, the generation of new combinations is facilitated because diverse cognitive frameworks contain different information and capabilities. In this regard, the density of relationships is of special interest because it corresponds to the potential for cognitive variety. Numerous interrelationships within the network actors provide access to different types of knowledge that are possessed by different actors. Furthermore, it is important to note that depending on the cognitive distance, the strength of relationships needs to be modified. The optimal design of a combination between density and the strength of relationships will be elaborated in the following section with regard to two network strategies.

CHOOSING THE RIGHT NETWORK STRATEGY TO MANAGE EXPLORATION SUCCESSFULLY

Strategic options to deal with uncertainty

Exploration stands for renewal, i.e., the development of new resources and capabilities and, therefore, a modification of the network organizations` resource base that can be used to generate competitive advantage. Taking into account the uncertainty of the environment, embedded organizations can pursue two different **network strategies** to achieve the goals of exploration: First, a focused deepening of the resource base is possible that implies an active

[3]Absorptive capacity is defined as the receptiveness of new information and the transformation into knowledge (Cohen/Levinthal 1990).

configuration of the environment. This approach is called **configuration strategy**. Second, a diffusion of resources can be aimed for to increase the network's flexibility. Such a broadening of the resource base is possible by adopting an **accommodation strategy** (Wernerfelt/Karnani 1987).

At its core, an accommodation strategy involves the improvement of learning capabilities and the facilitation of change processes. To this end, resources are broadly dispersed, avoiding a strong resource commitment. The broad dispersion of resources causes flexibility in pursuing explorative goals. The strategy results in developing different options of resource combinations that can be tapped rapidly. As a result, "*weak ties*" to new actors are typical of this strategy (Granovetter 1973). In contrast, an active configuration of the environment by purposeful changes of the resource base is the essential part of the configuration strategy. If a configuration strategy manages to shape the environment to the networks` s advantage, a reduction of decision-making uncertainty within the network will result. All endeavors are concentrated on developing a new set of unique network resources. The resource base is extended within a well pre-defined area for the purpose of developing a deep resource position. Consequently, the configuration strategy involves "*strong ties*".

In a continuously changing institutional environment, a network strategy that seeks to reduce decision-making uncertainty resulting from complexity and variability has to fulfil the functions of **coordination** and **adaptation**. If high **complexity** is predominant, a network strategy has to accomplish the function of coordination. Coordination is ensured by following a **configuration strategy**. A network strategy with strong ties is capable of handling complex environments. Such a strategy facilitates an efficient and fast coordination and enhances the probability of spillovers that support mutual learning and understanding. However, if high environmental **variability** is predominant, the function of adaptation is of primary concern so that the **accommodation strategy** becomes relevant. Variability within the institutional environment requires the inclusion of new actors into the network. These actors provide access to other networks and resources with different cognitive perspectives, and, therefore, are a central source of diversity (Granovetter 1973).

Network strategies – Structural options in light of exploration

Exploration based on networks of interorganizational relationships serves either to actively configure the environment or to accommodate the network to environmental developments. Networks need to manage the trade-off between pro-active change and reactive adaptation, and, depending on the main direction of a network strategy, the focus should be on establishing "weak" or "strong ties".

To fulfil the adaptation function in high variability environments, flexibility in exploration is called for. Thus, "weak ties" are favored that provide different cognitive perspectives as a base for generating new combinations. By the use of "weak ties" both, the size of the network, and the chance to gain access to additional information is enhanced. Under these circumstances, the **accommodation strategy** is suggested as the appropriate network strategy. The breadth of the knowledge and resource base allows for many different directions of network development. The adaptation ability is enhanced by avoiding deep resource commitments. To improve, the network's ability to learn and to change, it is necessary to tap a wide variety of resources and capabilities. In order to establish learning and change in the network, an innovation orientated culture is beneficial in addition to a broad resource base. To assure the requisite flexibility, broad investments should be made, e.g., into research and development or broadly applicable machinery (economies of scope). In the case of the accommodation strategy, the developed "weak ties" are characterized by **high density and low strength of relationships**, accompanied by low durability and frequency as well as restricted relational trust. Such ties give access to other networks and are thus a source of diversity (Granovetter 1985). A network configuration with high density and low strength of relationships holds the advantage of facilitating a fast recombination of diverse information contained in different networks, which allows for an effective exploration of new combinations. However, the recombination of different types of knowledge based on "weak ties" can also cause problems, e.g., misunderstandings, which can arise as a result of high cognitive variety.

Due to the breadth of available resources in the case of establishing "weak ties", a focused and active configuration of the environment is difficult to attain. To this end, a different relationship structure is necessary, because the depth – not the breadth – of the resource endowment is relevant. In order for a network to actively influence the environment while

pursuing exploration, it is necessary to create "strong ties," and thus the **configuration strategy** becomes advantageous. Relationships within the configuration strategy need to provide for a focused, deep, and reliable access to specific information and resources. The resource base of a network is enlarged in a pre-defined area, with the aim of establishing a resource position with depth, i.e., additional capabilities. Thus, research and development efforts are concentrated on just a few areas and technologies typically within a single business segment. "Strong ties" can be used to fulfil the coordination function. In other words, a network structure with **low density and a high strength of relationships** should be established. Such a structure makes it possible for the actors and coordination to be focused on a specific task. The durable interactions necessary to the maintenance of strong ties require a limited cognitive distance between the organizations. Otherwise, the exchange of context specific, implicit knowledge cannot be obtained efficiently. Durable relationships allow for a continuous search of specific information furthering the network` s goal attainment. Aside from the frequency of interactions, high relational trust (another dimension indicative of the strength of relationships) is necessary. This trust is expressed by the willingness of the actors to share knowledge in order to advance exchange and exploration processes. An active configuration of the environment is the central advantage of this network strategy. However, the low flexibility to react fast to environmental changes (especially because of the required specific investments) is a drawback.

CONCLUSIONS

Interorganizational relationships are a special form of capital. They can be applied by organizations and networks of organizations, to pursue specific competitive goals. If the intention is to initiate processes of exploration, that are based on such relationships, the proposed model of social capital (Fig. 1) allows to specify the optimal configuration of the network structure. If the primary aim is to actively configure the environment so as to manage high complexity, a network structure with low density and high strength of relationships is beneficial, i.e., a configuration strategy. If the adaptation to changing environmental conditions is the main concern of the embedded organizations so as to handle high variability, a network structure with high density and low strength of relationships is appropriate, i.e., an accommodation strategy. Based on the presented distinctions, a systematic explanation of the interdependencies between networks of interorganizational relationships, different goals of exploration, as well as potentially associated competitive advantages, becomes possible.

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