
Network Management as a Set of Dynamic Capabilities

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Abstract

This conceptual paper focuses on the management challenges of different types of strategic business nets. First, we propose a value-system continuum that forms the basis for classifying different types of strategic nets. Second, the core managerial questions and capabilities required in net management are illustrated. A discussion of the theoretical and managerial implications, and of future research needs, concludes the paper.

Key words: Business networks, dynamic capabilities

Introduction

The fundamental question in the field of strategic management is how firms achieve and sustain competitive advantage. Since Teece et al (1997) produced their seminal article, the focus has been on exploring the capabilities through which management renews resources and competencies. We suggest that this evolving dynamic-capabilities view should be related to the challenges posed by operating in a network context, as in the Industrial Network theory (Håkansson and Snehota 1995), and to the issues faced in building so-called strategic value nets (Jarillo 1993), Parolini 1999).

Why is the network perspective important? The way economic value is created is radically changing. The importance of knowledge, technological complexity, global competition and digital information technology are driving this change. Empowered by the digital media, network organizations are expected to take the leading role in economic and social innovations (Castells 1996, Grabher 1993, Jarillo 1993, Parolini 1999, Thompson et al. 1994).

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Business networks have been the subject of many different approaches; Araujo and Easton (1996) identified no less than 10 different schools or traditions. However, the majority of research has focused on the general characteristics of organically evolved networks, and on their structure and development processes (Möller and Halinen 1999). Much less attention has been paid to intentionally developed nets and their management, with the notable exceptions of the work of Jarillo (1993) and Parolini (1999) on value nets, and the emerging theory of network governance in economic sociology and strategic management (Amit and Zott 2001, Gulati et al 2000, Jones et al., 1997).

The main thrust in the discussion on dynamic capabilities has been on how firms integrate, reconfigure, renew and transfer their resources. This internal emphasis is logical because the capability perspective originates from the resource-based view of the firm (RBV), which considers strategic capabilities as a pool of the internal resources that are important for the creation of competitive advantage (Penrose 1959, Rumelt 1974, Wernerfelt 1984, Barney 1991). Although the relevance of exploiting “external resources” (Teece et al 1997), the importance of “alliance and acquisition routines that bring new resources into the firm from external sources” (Eisenhardt and Martin, 2000, p. 1108), and the “ability to integrate efforts of different actors” (Grant 1996) has been mentioned, the challenges involved in operating in a complex network remain fairly unarticulated. Past work, as Lorenzoni and Lipparini (1999, p. 318) note, “has tended to consider networks as given contexts, rather than a structure that can be deliberately designed.”

We aim to contribute to the development of network management by integrating notions from Industrial Network Theory (INT) and the Dynamic Capabilities View (DCV). The first section concerns the nature of strategic networks in a value-system framework, and the second examines network management from the perspectives of INT and DCV. The objective is to identify the basic capabilities required in managing different types of strategic nets, and to elaborate their characteristics and interrelatedness.

The Multiplicity of Strategic Nets – A Value-system Perspective

It is important to distinguish between a “network of organizations” and a “network organization”. The former refers to any group of organizations or actors that are interconnected in exchange relationships. According to INT, any market can be described as this kind of macro network (Axelsson and Easton 1992, Håkansson and Snehota 1995). Achrol (1997, 59) suggests that: “a network organization is distinguished from a simple network ...by the density, multiplicity, and reciprocity of ties and a shared value system defining membership roles and responsibilities.” This is in line with Amit and Zott (2001) and Gulati et al. (2000), who see strategic networks as “stable interorganizational ties, which are strategically important to participating firms”. Since a business network can be assumed to pursue established goals, we add intentionality to these definitions. Moreover, we reserve the “network” term to refer to macro networks, and the “net” to refer to intentional nets of a restricted group of actors.

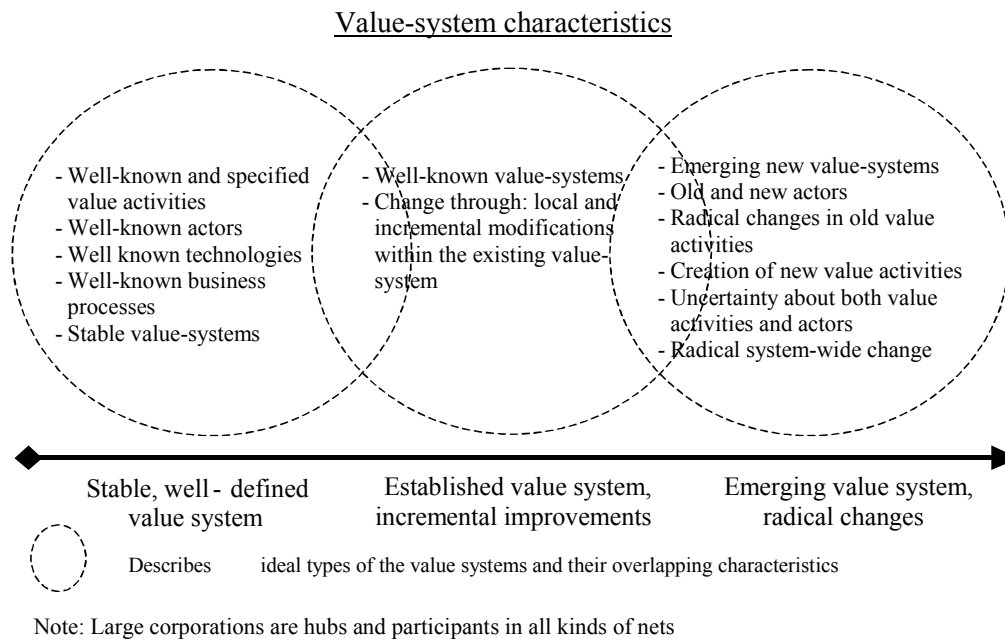
In order to understand the management challenges posed by different types of strategic nets – supplier nets, distribution nets, R&D nets, competitive coalitions such as the airline alliances, and technology-coalition nets such as Bluetooth - we need a systematic description of their characteristics. Essential to any strategic net is the underlying system through which it produces value. This value-system construct is based on the notion that each product/service requires a set of value activities performed by a number of actors forming a value-creating system, using Parolini’s term (1999, p. 59-68). A key aspect is that value creation spans firm and industry boundaries (Amit and Zott, 2001), and can be encapsulated in the value system. This is not a new concept, and has been given different shades of meaning by authors such as Håkansson and Snehota (1995), Normann and Ramirez (1993), Parolini (1999), Porter (1985), and Rayport and Sviokla (1995). We contend that the level of determination of this value system provides the key for identifying the management requirements of the net. In other words, how well-known are the value activities of the net and the capabilities of the actors to carry

them out, and to what extent can these value activities be explicitly specified? The greater the level of determination of the value system, the less uncertainty there is and the less demanding its management, all other things being equal.

Figure 1 shows a simplified continuum of value systems (VSC) described through the characteristics of three ideal types. The left end describes clearly specified and relatively stable systems. The actors producing and delivering specific products, and their value activities and capabilities, are basically known. The multi-tiered supply systems in the automobile industry provide a typical illustration (Dyer, 1996). Benetton, Dell, IKEA and Nike illustrate well-specified supplier and distribution solutions based on strategic nets which, we suggest, generally pursue efficiency gains in terms of production/logistics and time compression, rapid growth opportunity, and access to a wider customer base.

The right end of the continuum describes emerging value systems aimed at developing new technologies, products or business concepts. These future-oriented nets may require radical changes in the existing systems and in the creation of new value activities. This is the landscape that Eisenhardt and Martin (2000) describe as “high velocity markets” (one could say that there are no markets in the early emergence, as markets presume structures that are constituted by relatively identifiable actors). For example, Internet portals and emerging mobile services are generally created through strategic nets involving a telecom operator, several “middleware-type” software producers, and content/services producers. Emerging value systems involve complex learning processes (e.g., the Bluetooth coalition) and an inter-organizational relationship formation that cannot be specified in advance. Uncertainty related to value activities and to actors and their capabilities is an inherent feature. In essence, nets creating emerging value systems pursue technology and business solutions that are pronouncedly more effective than the existing ones.

FIGURE 1
Value-System Continuum



The middle of the continuum describes value systems that are relatively well determined, but that are being modified through incremental and local improvements. Most multi-actor R&D projects, as well as business-process modifications, exemplify these kinds of changes. Generally, these nets aim at increasing the efficiency of the existing system, but may also lead to more effective solutions that could turn into new business opportunities.

The proposed value-system continuum is a highly abstract and static framework, and its ideal character must be underlined. In reality, we will never find completely determined or undetermined systems. The continuum distorts the networked world in other aspects, too. Most large corporations have roles in various nets. Moreover, many strategic nets “stretch” across at least two ideal types. Various nets may be interrelated through actors having roles in several. This kind of multiple involvement allows innovative companies, through their accumulated knowledge of other relevant actors and their capabilities and liaisons, to create temporal strategic nets for specific development purposes. Finally, the “contents” of the VSC,

the strategic nets, are in constant evolution. Once nets creating innovative services such as e- and m-banking are specified, they “move” towards the left end of the continuum.

This brief analysis reveals the inherent variability in these value systems. It is obvious that different capabilities are needed for successful management in stable and well-specified nets than in the emerging, complex nets characterized by high uncertainty.

Network Management as A Set of Dynamic Capabilities

A few guidelines should clarify the idea of network management as a set of dynamic capabilities. First, we should identify the special characteristics required for network as opposed to intra-organizational management, managing market-based, and dyadic business relationships. Second, the requirements identified should be compared with the extant knowledge of dynamic capabilities. These are broad and complex issues; we address them by relying on a limited set of recent publications and maintaining a high abstraction level.

Management in Nets – Specific Requirements

We follow Möller and Halinen (1999) in addressing the key issues in managing strategic nets on four interrelated levels: (1) macro networks, (2) strategic nets, (3) net and relationship portfolios and (4) strategic relationships. The first three are briefly dealt with because strategic relationships are well covered in the extant literature (Doz and Hamel 1998, Håkansson 1982, Halinen 1997, Möller and Wilson 1995, Ring and Van de Ven 1994).

Key Management Issues at the Macro-networks Level

According to the industrial-network theory (INT), “industries” or fields constitute enmeshed networks of actors, connected through direct and indirect ties. There are no “faceless markets” and actors pursue their interests through webs of connections with other actors (Håkansson

and Snehota 1995). This makes industries non-transparent and dynamic. How can we develop valid views of relevant networks and their opportunities? How can we analyse strategic nets and key actors in order to understand network competition? How can we influence whole networks?

In navigating the network environment, management should identify and understand the value systems and key actors through which the macro network produces value for the end-customers. The more complex and volatile the value system is, including tacit knowledge, the more challenging the task. We label this capability network visioning, and argue that it is not covered by traditional environmental scanning that assumes ontologically relatively concrete and transparent markets, processes and actors; nor does the notion of relational capability focusing on dyadic-relationship management paint the whole picture (Dyer and Singh 1998, Lorenzoni and Lipparini, 1999).

Large corporations may try to shape the development of macro networks by influencing the beliefs, goals and behaviour of other key actors through “orchestration”. This question of influence is not adequately addressed in RBV-driven dynamic capabilities such as alliance formation, mergers and acquisitions, and signalling.

Key Management Issues at the Strategic-nets Level

INT describes business fields or clusters (Porter 1990) as several overlapping strategic nets, the management of which requires the mobilisation and coordination of the value activities of other relevant actors. Crucial questions include how a hub company can build value-producing nets, and what positions and roles it should take in different and overlapping nets, across various strategic situations. Net strategies may be divided into (i) improving operational efficiency, (ii) improving the leverage of existing capabilities, and (iii) developing new capabilities (Loeser 1999). These strategies may involve using existing positions, entering existing nets, or establishing new ones. The fact that several goals can be pursued through one

complex net, or a set of overlapping nets, further complicates their management. Although there is an increasing number of studies on network governance – addressing issues such as the role of trust in network relationships, sharing and co-producing knowledge in firm relationships, and coordination routines – we are far from producing an articulated theory of net management (Blankenburg et al., 1999, Dyer and Nobeoka 2000, Gulati 1999, Jones et al., 1997, Ramirez, 1999). Existing studies provide an understanding of relational management, but they do not cover the issues of mobilizing and coordinating a group of autonomous but interdependent actors, or recognize the complexity in achieving net -level efficiency (Ford and McDowell, 1999, Gadde and Håkansson 2001, Håkansson et al., 1999).

Key Management issues at the Net-portfolio Level

The management of strategic nets could be seen as a portfolio problem. In which nets should one operate, and how should one coordinate one's net positions? Determining which activities to carry out in-house and which to channel through different nets is a core strategic issue involving not only the allocation of scarce resources, but also the creation of new ones. Major companies pursuing several, often interrelated, businesses are generally involved in many strategic nets, either in an integrator role (hub firm) or in various partnering roles for other hub firms (e.g., technology partner, component supplier, distributor partner). In short, management faces a complicated optimisation challenge concerning in which nets to operate and through what kind of roles and strategies. This includes issues such as evaluating the future importance of the value net in terms of its business potential, evaluating one's own influence potential, and determining how the nets are interrelated and how a firm should take that into account in coordinating its portfolio of positions. These questions remain basically unaddressed in discussions of strategy and RBV-driven capability, and have only been touched on in INT (Ford and McDowell, 1999, Gadde and Håkanson, 2001, Möller, Rajala and Svahn 2002).

Net Management – A Dynamic-capability Perspective

Our discussion of the challenges in the management of strategic nets remains rather general. It is obvious from the Network-capability-base Framework, described in Figure 2 that the type of net has a strong influence. The framework shows, in a simplified manner, how capabilities are linked to value creation in the network context. We should point out that we use the term capability as Grant (1998) did to refer to a firm's capacity to produce a certain value activity. As such, a capability generally implies a set of resources and knowledge of their usage. The dynamic-capabilities extension to the RBV explores how valuable resources are created and acquired over time in order to achieve or maintain competitive advantage. Dynamic capabilities (DCs) are rooted in a firm's managerial and organizational processes aimed at the creation, coordination, integration, reconfiguration or transformation of its resource position (Amit and Zott 2001, Eisenhardt and Martin 2000, Teece & al. 1997). Eisenhardt and Martin (2000) regard DCs as identifiable and specific processes rather than as tacit and idiosyncratic, and give product development, resource-transferring processes, knowledge creation, strategic decision making, and alliance formation as examples. We share their view on the identifiable character of DCs, but contend that the current set should be expanded to include a number of networking capabilities.

FIGURE 2
Value Production and Network Capability Base

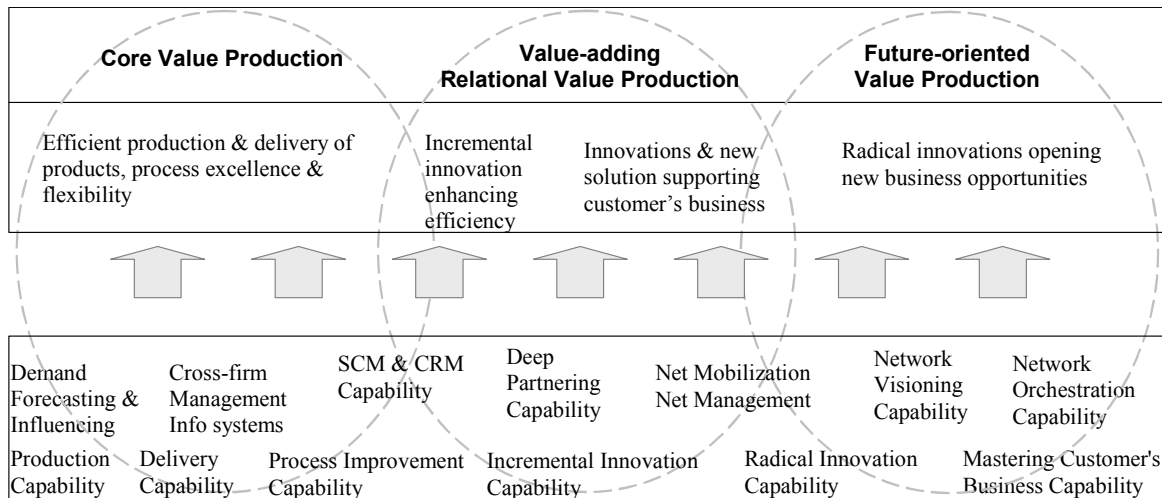


Figure 2 shows the capabilities needed in network-value production in an approximate order of ascending complexity. This does not imply that those at the left end of the continuum are less important. On the contrary, being able to produce core value through established vertical nets is often a necessary condition for achieving incremental innovations through developmental nets, which may initiate more radical innovations through future-oriented strategic nets

The capabilities are presented on two rows. The lower row refers to more traditional DCs (with the exception of production and delivery capability that are not generally considered dynamic), and the upper row to those needed in managing strategic inter-organisational relationships and business nets. A set of capabilities is generally required to produce any type of value. Broadly speaking, the more complex the value system is, the more multifaceted the required set of capabilities becomes.

If we start from the left and examine the management of an efficient customer-driven supplier net, it is clear that the ability to integrate and coordinate the value activities of each net member is essential. A prerequisite is that the hub can mobilize a set of actors willing to form

a tightly coordinated supply and channel net. This requires a well-established position in the field, and keen customer demand reflected in strong brands as exemplified by Nike and Dell. A strong demand position is essential for signalling important component vendors that they can benefit from a closer value net in terms of larger volumes and more stability. The stronger the position of the hub firm, the more selective it can be in choosing the net actors.

The coordination capability of this kind of vertical value net is manifested in the information and management systems that combine the business processes of each actor and monitor the efficiency of production, logistics, and customer delivery and service. In an advanced case, this would lead to the coordinated management of a complete value system, ranging from customer care to component production, and would require the combination of tools of Supply Chain Management, Enterprise Resource Planning, and Customer Relationship Management (see e.g., Means and Schneider 2000, Lambert and Cooper 2000).

When a strategic net is used for fostering local product, production-technology or business-process innovations, more intimate and trustful relationships are needed. Joint knowledge creation requires an open culture (Dyer and Nobeoka, 2000, Lorenzoni and Lipparini, 1999, Nonaka and Teece, 2001). This demands a partnering orientation and personnel who have the strong interaction skills required in multiparty and cross-functional teams. Actors must share privileged organizational knowledge and be able to view value activities and changes in them from each other's perspectives. It would be critical to create what Dyer and Nobeoka (2000) call a network identity among the actors. A hub firm should also be able to evaluate these and the innovation capability in its partner candidates, manifested in a track record of improvements. A partner firm should be able to evaluate which available and emerging nets to aim for; i.e., which ones provide it with the best chances of enhancing its own business potential.

The creation of strategic nets to develop novel products and business concepts demands several complex capabilities. A hub firm should be able to envisage the development of the business in question in order to identify and evaluate potential net partners and set realistic

goals, as evidenced in a record of technological and/or business breakthroughs in one or several fields. The mobilization of a net requires a strong position in the field; the hub firm must have specific resources and knowledge that make it an attractive mobilizer so that it is able to select autonomous partners and manage the resulting strategic net. Net management requires an organization-wide network-player orientation, with the key personnel sharing and supporting the achievement of joint goals. The hub firm must also be able to create an organizational forum for sharing the work and responsibilities between the actors, to establish coordination mechanisms for net cooperation, and to instil a network identity (Dyer and Nobeoka, 2000, Gadde and Håkansson 2001). This includes organizing multilevel and multifunctional contacts, and teams in general, involving several actors and supported by an integrated information system. This “macrocultural” aspect remains quite unexplored (Jones et al., 1997). It is thus clear that net management, especially in innovative nets, involves knowledge management. Actors must be able to foster the learning environments that allow the explication and combination of tacit knowledge, and the sharing of new knowledge (e.g., Nonaka and Takeuchi 1995).

Finally, network-orchestration capability at the right end of the value-creation continuum refers to an actor’s capacity for influencing the evolution of a whole new business network. Orchestration presupposes the ability to envisage the emerging business field - which may be very complex like the convergence of the ICT field suggests - and its key actors, and to identify potential trajectories. Being involved in different parts of the emerging network enhances this managerial sense making, as it introduces several learning experiences and new perspectives. However, these experiences can only be turned into visioning capability if top management is able to bring together various organizationally-dispersed views in a knowledge-management system. A major actor could thus develop an agenda for influencing the field in a preferred direction. Agenda setting involves communicating one’s beliefs or visions of where developments are and should be leading. Clearly, not any actor can become a network

orchestrator. The role requires visioning and strong communication and persuasive skills, coupled with the credibility that can only be achieved through thorough understanding of the field and a strong business position. Firms with eminent roles in several strategic nets have a good basis for becoming network orchestrators. However, even extensive resources do not guarantee this, as illustrated by IBM's failure to anticipate the emergence of personal computers and the changing role of the operating system owned by Microsoft in the computer industry's value system (Fine, 1998).

Conclusions

We have used the Industrial Network Theory and the Dynamic Capability View to identify some specific managerial challenges faced by firms operating in a network context. Following the value-system approach to business nets, we propose that new dynamic capabilities involving network visioning, net mobilisation and management, and network orchestration, are urgently needed. More traditional DCs, such as relational/partnering and the creation and management of multiparty management and information systems, need reinvestigation in the strategic-net context.

A comparison of our value-system continuum with the description of "high-velocity markets" by Eisenhardt and Martin (2000) shows that the nets aiming at creating future value match the characteristics of high velocity. We argue, however, that it is descriptively more valid to call these environments macro networks due to their inherent characteristic of interrelated and reciprocally dependent actors. Our conclusions about the kind of capabilities needed are the same, however. Net-level knowledge creation, transfer and application capabilities are essential in the management of innovative nets. An integrator should also try to moderate causal ambiguity by pooling the experiences of other actors, and engaging in rapid experimentation. Experimental learning should be supported by codification and process building so

that experiences are turned into coordinated future action. More broadly, we believe that the nets operating in highly dynamic contexts need to exert some control over the flux, and that stable nets would benefit from increased flexibility and the fostering of continuous incremental innovations.

Eisenhardt and Martin (2000) argue that the RBV breaks down in a high-velocity context because the competitive advantage gained by the current resource pool becomes unpredictable, and dynamic capabilities are themselves unstable. We are more hesitant to impose a clear boundary condition. Although many dynamic capabilities become unstable, there are signs that firms that have both strong learning and network capabilities are able to learn more quickly and from a larger experience and competence pool available from strategic nets and partnerships they are involved in, and are able not only to survive change, but also to create it and even influence new path dependence through network orchestration. In other words, a new set of dynamic capabilities seems to differentiate firms and nets in their ability to manage and utilise change.

We believe that, in order to further understanding of the dynamic capabilities required in high-velocity contexts, we have to expand our level of analysis from that of the organization to what we call strategic nets, and also to the macro networks forming their environment. The problem is the increasing methodological complexity. It seems evident that strategic nets can both create and master capabilities that are beyond the capacity of any single actor. In this sense, the nets in which the firm operates condition its internal resources and capabilities, and their developmental potential. Both the firm and the net should be regarded as agents (see Hellgren and Löwestedt, 1998) that are engaged in a simultaneous structurization process; the firm influences the structure and processes of the net, but the net also influences the resources, behaviour and options of the firm. In a similar vein, it would be profitable to examine more systematically how macro networks influence the types of strategic nets that are competitive.

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