CREATING THE N-FORM CORPORATION

AS A MANAGERIAL COMPETENCE

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CREATING THE N-FORM CORPORATION AS A MANAGERIAL COMPETENCE*

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CREATING THE N-FORM CORPORATION AS A MANAGERIAL COMPETENCE

ABSTRACT

This paper discusses key properties of the N-form corporation or internal network forms of organizing from three mutually related perspectives: structure, knowledge flows and management processes. To operationalize knowledge flows, a key property of N-forms, the paper suggests a new measure, the H/V ratio, to empirically assess the configuration of knowledge flows. The argument is illustrated by a case study of a firm showing that top management's perception about having an internal network contradicts with reality as vertical knowledge flows appear to dominate the horizontal ones. The managerial competence required for creating internal networks aimed at knowledge creation and sharing will be discussed.

KEYWORDS

Organizational forms; Knowledge Flows; Managerial competence; Internal networks; N-form Corporation.

INTRODUCTION

Prompted by increasing environmental dynamics, firms are being compelled to shift the focus to managing knowledge sharing and creation effectively. Since traditional “mechanistic” organizational forms and corporate models were apparently not well-suited to allow for the effective management of knowledge, firms have adopted more “organic” organization forms such as *external* networks with firms outside their boundaries (Burns and Stalker 1961, Hitt et al. 1998). From a competence-based perspective, among others, Quelin (1997), Sivula, Van den Bosch and Elfring (1997), and Stein (1997) have argued that these external networks, such as strategic alliances, joint ventures, and similar collaborative partnerships, ameliorate the processes through which new capabilities and knowledge may be created. Based on comparative case studies of American and Japanese firms, similar findings are reported by Hamel (1991).

More recently, however, firms have also started to adopt *internal* network forms of organizing to enable knowledge sharing and knowledge creation. Although theories on internal networks or N-form corporations (Hedlund, 1994; Nohria, 1996) have recently begun to prosper, the emanated insights almost exclusively focus upon the ideal-typical features once an N-form is established. The most prevalent feature ascribed to the N-form in these theories is that knowledge flows are primarily horizontal between organizational subunits rather than vertical from headquarters to subunits, as is the case in more traditional organizational forms (see, e.g., Hedlund, 1994). Important questions, both managerially and scientifically, remain, however, as to how this feature and other N-form characteristics are created and assessed in practice, and whether a particular managerial competence is required.

To contribute to answering these questions, this paper analyses the N-form from three complementary perspectives: (1) organizational structure, (2) management processes, and (3) knowledge flows. Owing to their organizational structure, managerial processes, and horizontal knowledge flows in particular, N-forms enable high levels of coordination and integration of knowledge (*cf.* Grant, 1996; Prahalad and Hamel, 1990). Consequently, in this paper it is assumed that the creation and development of N-forms not only constitutes a managerial competence itself, but also serves as an enabling device to create and deploy other firm-specific and firm-addressable competences, more so as compared to traditional organizational forms.

Based on a questionnaire and interviews regarding the knowledge flow configuration, the findings of a case study of a firm which, as suggested by its CEO, might be an internal network will be elaborated and discussed. The H/V ratio, which relates the managerial perceptions of the incidence of horizontal to those of vertical knowledge flows (Van Wijk and Van den Bosch, 1998), will be employed as a means to capture the knowledge flow configuration of a firm, and the knowledge integration processes associated with that. As knowledge integration serves as the basis to forming competence, by corollary, the H/V ratio also serves as a first and preliminary indicator to assess whether a firm's organizational form reflects the mastering of a managerial competence. Elsewhere, we have argued analogous to Grant (1996) that managerial capability is the result of the integration of different kinds of individual knowledge in a team or the entire firm (Van den Bosch and Van Wijk, 1998). Grounded in the case study which provides contradictory evidence with regard to the CEO's suggestion, the thesis of this paper is that the creation of the N-form is constituted and enabled by a new *managerial competence*. It is argued that internal networks challenge the knowledge integration process to such an extent that a firm's management acquires a new managerial competence.

The paper is structured as follows. In the next section, the N-form will be analyzed from three perspectives. Based on this analysis, it is conjectured that the creation of internal networks or N-form corporations constitutes a managerial competence. Subsequently, the results of a case study involving an 'internal network' will be presented and discussed. These findings suggest that the creation of an internal network, as is reflected in a particular H/V ratio, requires a managerial competence indeed. The final section discusses and concludes.

THE N-FORM CORPORATION: THREE PERSPECTIVES

Bartlett and Ghoshal (1989) have proposed a biological analogy that organizational form not only consists of an anatomy (i.e. structure), but also of a physiology (i.e. processes) and psychology (i.e. management styles, cultures and values). This view is conform Baker's (1992) who argues that environmental characteristics influence organizational characteristics, such as structure, and task characteristics, such as managerial functions, but which passes by the distinguishing feature of internal networks, that is knowledge flows. It is both conceptually and managerially appropriate to address N-forms from a knowledge perspective as well. Therefore, in this paper N-forms are addressed from three different but mutually related perspectives, which are (1) organizational structure, (2) knowledge flows, and (3) management processes. Each will be worked out below. Thereafter we will reflect on "complementarities" that exist between structure, knowledge flows and management processes within N-forms.

Organizational structure of N-forms

One of the underlying factors that accounts for the emergence of internal network forms is the increasingly dynamic and global environment, which requires firms to be flexible (Miles and Snow, 1994; Pettigrew et al., 1996; Volberda, 1998), and which necessitates a resilience in being locally responsive while maintaining a global profile (Bartlett and Ghoshal, 1989; 1993). For that purpose, internal networks are characterized by a heterarchical structure rather than a hierarchical structure. This presumes that the structure of internal networks is constituted by a decentralized, dense set of dispersed, differentiated, but interdependent organizational units (Hedlund, 1986). Because 'knowledge is a resource that is difficult to accumulate at the corporate level and ... that those with the specialized knowledge and expertise most vital to the companies competitiveness are usually located far away from corporate headquarters' (Bartlett & Ghoshal, 1993: 32), each unit has a certain stock of knowledge localized to a certain geographical area, a particular market, a certain technology, a particular problem, or otherwise, grouped under a certain strategic logic (Sanchez and Heene, 1996).

As each unit more or less performs different activities using different asset stocks (Håkanson and Johansson, 1993), organizational units may be regarded as decentralized specialists (Nohria, 1996) adhering to 'economies of depth' rather than to economies of scale or scope (Hedlund, 1994). Since the organization units of an N-form are more or less different as far as specialism i8s concerned (Hedlund, 1986), the N-form corporation enables a multitude of search processes to build different capabilities and competence 'capable of being applied to some set of alternative uses [giving] the firm a better chance of responding effectively to a range of future changes' (Sanchez and Heene, 1996: 59).

In addition to the differentiation of actors, and activities, resources and knowledge which serve as the basis to *building* competence are also differentiated. As a consequence of this differentiation, each unit is dependent on the performance of other units and are, therefore, required to collaborate (Håkanson and Johansson, 1993). These interdependencies across units enable the *leveraging* of competence (Sanchez, Heene and Thomas, 1996). The ability to leverage competence across an N-form's dispersed units is built on the presence of a high degree of trust, reciprocity, and a distributed power structure, as alternatives to the authority and price mechanisms of hierarchies and markets respectively (Bartlett and Ghoshal, 1989; Bradach and Eccles, 1989; Handy, 1992; Miles and Snow, 1994; Nohria and Ghoshal, 1997). Another way interdependencies are created and maintained within the N-form is by way of teams and other temporal constellations of different people from varying organizational levels that make the N-form a recomposable system (Hedlund, 1994). In that connection, the N-form is also able to realize 'coordination flexibility' by means of asset flows that create interrelated asset stocks, which may be deployed to alternative uses (Sanchez and Heene, 1996).

Knowledge flows within N-forms

Knowledge processes in N-form corporations involve the knowledge creation by network actors resulting in asset stocks (*cf*. Nonaka and Takeuchi, 1995) or knowledge assets (Boisot, 1998), and the sharing of that and other knowledge, previously acquired, among network actors by means of asset flows (Hedlund, 1994). Therefore, the key advantage of the N-form corporation arises from 'its ability to create value through the accumulation, transfer, and integration of different kinds of knowledge, resources, and capabilities across its dispersed organizational units' (Nohria and Ghoshal, 1997: 208). This knowledge sharing capability allows for the *integration* of knowledge which is *differentiated* (Baker, 1992), and therefore provides the basis to both building and leveraging competence.

In internal networks, knowledge is usually located in the localities of the network actors, such as international subsidiaries of multinational corporations (Nohria and Ghoshal, 1997). In that connection, knowledge within the firm is dispersed, and when required knowledge transcends the locality, 'experiments with varying constellations of actors are necessary' (Hedlund, 1994, p. 83). This recurs in the widespread use of teams and projects, in which, in line with the open systems view of the firm (Sanchez and Heene, 1996), both organizational members and people outside the corporation are represented as human assets to share and integrate their knowledge and competence (Perrone, 1997). In addition to teams, network actors might also experience incongruent product and knowledge domains (Grant and Baden-Fuller, 1995) or insufficient knowledge for local strategy formation for which they need to consult other internal network actors as an alternative or complement to the consultation of corporate headquarters in more traditional organizational structures.

To highlight a key knowledge sharing property of internal networks, we will introduce a distinction between *vertical and horizontal knowledge flows*. As these knowledge flows clearly differentiate the various organizational forms, we will focus on knowledge sharing. In more traditional organization forms governance structures such as the U-form and M-form, knowledge flows are primarily vertical and uni-directional from headquarters to divisions, business units, and operating units. In network organizations, however, it has been argued that knowledge flows are, to a large extent, horizontal or lateral, and, above all, bi- or multidirectional (Hedlund, 1994; Quinn, Anderson, and Finkelstein, 1996). Therefore, to gain insight into the sharing of knowledge, the open systems view of the firm can be extended regarding internal organization to incorporate issues concerning the perceived incidence of both horizontal and vertical knowledge flows in attaining sustainable competitive advantage.

Management processes within internal networks

With regard to the various managerial levels within the network organization, Bartlett and Ghoshal (1993) indicate that the managerial roles and processes at these levels differ substantially from those in firms with more traditional organizational forms. Instead of being the composers of the grand strategies, top management's role in the N-form corporation is setting out a vision (Bartlett and Ghoshal, 1993), which serves as the intent of the corporation (Sanchez and Heene, 1996). In so doing, they provide a proper context, based on the engendering of trust, shared by other management levels for the creation and sharing of knowledge (Hedlund, 1994), and for the building and leveraging of competence which are build on this knowledge.

Since strategic responsibility is to a large extent decentralized to lower levels of management, it can be argued that the most appropriate level at which strategies are formed is shifted to middle management. Like other contributors such as Hilmer and Donaldson (1996, p. 22) who criticize the management fad "that middle management is inherently destructive or at least unnecessary" and Floyd and Wooldridge (1996) and Nonaka and Takeuchi (1995), Bartlett and Ghoshal (1993) stress the importance of middle management in general, and regarding the N-form corporation in particular. Middle management's major function is to share resources, skills, and knowledge laterally among organizational units. Accordingly, applied in the open systems view of the firm in competence-based competition, middle management in the N-form takes over the role of top management in traditional organizational form in coordinating the asset stocks and flows within the firm (Sanchez and Heene, 1996). By means of these *lateral managerial mechanisms and relations* that allow asset flows to proceed among the N-form's units and new combinations of knowledge to take place resulting in new competence, the often long vertical path to and from headquarters is circumvented. In turn, this results in a greater responsiveness of internal networks to the compelling environmental demands. In that spirit, rather than being the recipients of knowledge and the implementors of resource *allocation* decisions made at the top, middle management in network organizations is responsible for the *leverage* of resources, competence and knowledge.

Through the pursuit of new opportunities present in the environment, front-line management's function is to create the resources, skills and knowledge required for the localities of organizational units (e.g., market knowledge, technological knowledge), or elsewhere in the firm (Bartlett and Ghoshal, 1993). In that vein, front-line management fosters the building of competence, and the enhancement of asset stocks present at a particular organizational unit

Complementarities between structure, processes, and knowledge flows in N-forms

From a value chain perspective it is obvious that the activities of firms (such as logistics and production) and linkages between the activities cannot be changed in isolation (Porter, 1985, 1996; Van den Bosch and De Man, 1997). Changing one activity without taking into account related activities and their linkages may deteriorate a firm's value creation process and so its competitive advantage. Milgrom and Roberts (1995) basically use a comparable analysis in their "complementarity" approach stressing the interdependent nature of organization change and its relation to firm performance. As the exposition of the three perspectives above shows, complementarities between structure, processes and knowledge flows in N-forms are present indeed. A management team that creates an N-form by only changing structure will end up with inappropriate management processes and knowledge flow configuration. Changing managerial roles and responsibilities alone without changing structure and making the internal context appropriate to the emergence of horizontal knowledge flows will not produce an N-form. Clearly, creating N-forms means simultaneously changing structure, management processes and knowledge flows in such a way that each change complements the others. Needless to say is that these changes, and the coordination processes involved will not happen “automatically”. Management will play the key role in this complicated and firm specific process and hence this might give rise to a (new) managerial competence.

CREATING THE N-FORM AS A MANAGERIAL COMPETENCE

The assumption that creating the N-form corporation is a managerial competence is introduced for both theoretical and empirical reasons. From a theoretical perspective, the literature on how to create new forms of organizing or on how the transition processes from existing forms towards internal network forms of organizing take place is scarce. Exceptions are, for example, Ferlie and Pettigrew (1996) and Van den Bosch and Van Wijk (1999). The managerial characteristics, roles, and skills required for creating and, perhaps even more important, maintaining internal networks remain largely unexplored however. Based on Penrose (1959), it can be argued that management and managerial resources play a key role in the processes involved in creating and developing internal networks.

This key role could be illustrated from a “complementarities perspective” as well. Milgrom and Roberts (1995: 191) argue that “changing only a few of the system elements at a time to their optimal values may not come at all close to achieving all the benefits that are available through a fully-coordinated move, and may even have negative pay-offs”. Clearly, these “fully-coordinated” moves do not come out of the blue sky, but belong to managerial responsibilities. Our analysis of the properties of N-forms deliberately uses three mutually related perspectives, that is structure, management processes, and knowledge flows, because creating a N-form involves series of “fully-coordinated” moves over time regarding interdependent changes of structure, processes and knowledge flows. From an empirical perspective, it is remarkable to observe how difficult it is to create and develop internal networks and the tremendous managerial challenges involved in these efforts (Van den Bosch and Van Wijk, 1999). If the creation of N-forms in practice appeared to be difficult, firm-specific, and time-consuming and if succeeded, difficult to copy by competitors, than it is plausible to argue that a managerial competence to perform these efforts might be required.

As managerial capabilities are formed through the integration of individual managerial knowledge (Van den Bosch and Van Wijk, 1999), and the transition to the N-form also requires distinct managerial capabilities the ability to create the N-form can be considered as a new managerial competence. This managerial competence requires the involvement of managers and their knowledge at all levels in the organization. For example, Bartlett and Ghoshal (1997) found that top managers must have the ability to create an exciting and demanding work environment based on a grounded knowledge of the organization, its structure, its processes and its cultures. Within this view, the ability to delegate and empower, as well as the ability to develop relationships and build teams is shifted to middle managers who must perform these abilities on knowledge of where to find people in the organization, and how are the interpersonal dynamics between them make up. Furthermore, front-line managers must be able to constantly motivate and drive people towards the recognition of potential opportunities in the environment and the commitment they make upon these opportunities, requiring deep knowledge of the market and competitors as well as of internal and external resources.

Comparing the properties of the N-form, as suggested by the three discerned perspectives, to the definition of what a competence is, we suggest that the N-form can be viewed as a competence of value to a firm in dynamic environments itself. In the competence-based view of competition, competence is defined as the '*ability to sustain the coordinated deployment of assets* in a way that helps a firm *achieve its goal*' (Sanchez, Heene and Thomas, 1996: 8; original emphasis). Since the knowledge and managerial perspectives outlined above set forth the enormous potential for integrating knowledge to form competence and capabilities (Grant, 1996) by means of horizontal processes, the N-form provides an important basis as an enabling device for the building and leveraging of other competence. In addition, as the N-form constitutes the ability to sustain coordination by means of horizontal integration, the N-form itself may also be conceived of as a competence.

The H/V Ratio

The H/V ratio is proposed as a measure to analyze the extent to which an organization operates under the strategic logic of an N-form corporation (Van Wijk and Van den Bosch, 1998). Based on the argument above, it may serve also as an indicator to assess whether the required managerial competence to create and maintain a N-form is present. The H/V ratio relates the two distinct knowledge flows by dividing the perceived incidence of horizontal knowledge flows by the managerial perceptions regarding the incidence of vertical knowledge flows, and is formulated as

$$H/V\ Ratio = \frac{Horizonal\ Knowledge\ Flows}{Vertical\ Knowledge\ Flows} = \frac{H}{V}$$

Based on the theoretical contributions discussed above, we assume that firms with internal network forms or N-form corporations have an H/V ratio larger than 1, in which case horizontal knowledge flows have a higher perceived incidence than vertical ones. As such, firms with organizational forms having such a H/V ratio possess a competence for knowledge creation and sharing. In contrast, we expect the H/V ratio of more traditional organizational forms, such as the N-form and the M-form, to be lower than 1, indicating that vertical knowledge flows have a higher perceived incidence. Consequently, firms with H/V ratio's lower than 1 may be conceived of having less a competence regarding knowledge creation and sharing.

A SHORT CASE STUDY

To elaborate empirically on the knowledge flow configuration of internal networks and the managerial competence involved, a case study was conducted at Firm X.[1] Firm X is a large, European based multinational corporation whose aim is to provide services in a very competitive national and international market. In 1996, it had a turnover of more than 5 billion US dollars. The industry in which it operates is divided into a variety of subindustries, which are increasingly becoming integrated under the efforts of Firm X and its major rivals, enabling Firm X to benefit from any synergistic effect. Therefore, Firm X is structured accordingly, consisting of a central organization (corporate center) operating in the core industry, some affiliated subsidiaries competing in a related subindustry, and a substantial number of locally embedded units through which the clients are served. Recently, the CEO of Firm X has suggested publicly that the firm and its locally embedded organization units seems to have been a *network organization* for a long time, emphasizing that all units have their own responsibility meaning there is no subordination with respect to the central organization, see Figure 1. Moreover, he argues that the different parts cooperate along mutual service rendering based on equivalence, making it pre-eminently suitable for adapting to the constant changes in the organization's environment. Considering this perception of top management, however, one might wonder how to determine whether the firm has, in fact, created an internal network structure, and therefore, whether the required new managerial competence of creating the N-form is present.

Methodology

As did Bartlett and Ghoshal (1989) and Nohria and Ghoshal (1997) in their studies on internal networks, we made use of a questionnaire, interviews, and archival data. In our study, these empirical sources focused on the assessment of the incidence of vertical and horizontal knowledge flows as perceived by the managers of the local units of Firm X. Eighteen semi-structured interviews of about one to one-and-a-half hours were held in which general managers of local units were queried about their experiences with knowledge processes within their local units, between local units, and between the central organization and the local units. These interviews also helped us tailor the questionnaire to Firm X. The preliminary version of the questionnaire was tested on a few of the general managers from the central organization and the local units, in order to fine-tune it. After making the necessary adjustments, we sent the questionnaire to the general managers of 42 local units. The distribution of these 42 local units regarding size, type of area in which the unit is active, and number of employees of the selected units reflected the distribution of the total number of local units of X. Because of build-up commitment with the research project, all questionnaires were returned.

The questions addressed knowledge sharing at Firm X, for which answers could be ticked on an ordinal five-point scale ranging from ‘a large extent’ (5) to ‘a small extent’ (1). The question which we focus on in this paper concerned the degree to which in the perception of the general manager of a local unit obtained its knowledge either vertically, or horizontally.[2] Using the interviews as the input, vertical knowledge flows were operationalized as knowledge flows which are sourced from the central organization or one or more of its subsidiaries, whereas horizontal knowledge flows were operationalized as knowledge flows between local units based on collaboration (see Figure 1).

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insert Figure 1 about here

Findings

The flows of knowledge at Firm X appeared to be primarily vertical and uni-directional in the sense that the central organization or one of its affiliated subsidiaries is the main source of new knowledge for the local units. Supported by the interviews which reveal that the general managers of the local units tend to perceive the central organization as ‘thinking for them,’ the survey results, which are illustrated in Table 1, show that most knowledge is retained at and obtained from the corporate center. This finding is confirmed by considering the *z*-scores of all the respondents. From these scores it appears that only one of the 42 respondents perceived horizontal knowledge flows to be more prevalent rather than vertical knowledge flows. Most units rely on knowledge obtained from the central organization, through advisors of the central organization, seminars, company documents, or products. The central organization and affiliated subsidiaries invent and develop the core and related products and services respectively, and distribute these via the local units.

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insert Table 1 about here

Assessing the H/V Ratio

The questionnaire results in Table 1 also illustrate that lateral knowledge sharing among its dispersed local units does not frequently occur.[3] Nevertheless, this does not immediately say anything about the relationship between horizontal and vertical knowledge flows. In order to assess, in a single number, the extent to which the knowledge flows indicate whether Firm X operates as an internal network and may therefore be conceived a competence, the H/V ratio was suggested above that relates horizontal knowledge flows to vertical knowledge flows. If the H/V ratio is applied to Firm X, it may yield a value between 0.2 and 5, since the perceived incidences of the knowledge flows at X are measured on a scale from 1 to 5. Applying the means of the perceived incidence of vertical and horizontal knowledge flows, the H/V ratio of the sample of local units of Firm X is written as

$$H/V\ Ratio_{Sample} = \frac{2.49}{3.76} \cong 0.66.$$

Although this number indicates the relationship between vertical and horizontal knowledge flows at Firm X, in the sense that vertical knowledge flows are perceived to occur more frequently than horizontal knowledge flows, the actual H/V ratio of Firm X estimated for the entire population of local units at the 99% confidence interval lies within

$$H/V\ Ratio_{Firm\ X} \sim <0.54\ ,\ 0.81>.$$

The estimated H/V ratio of Firm X is clearly less than 1, indicating that vertical knowledge flows are perceived as occurring more frequently than horizontal knowledge flows.[4] As a consequence, the organizational form of Firm X is less a competence than should be the case.

DISCUSSION AND CONCLUSIONS

The case study results of firm X reveal there is a gap between top management perceptions regarding having internal network forms of knowledge processes and the actual situation as is reflected by assessing knowledge flows with the aid of the H/V ratio. At first glance, Firm X has a clear internal network structure consistig of locally embedded interdependent organization units facilitated by a central unit, which is supported by the CEO's perception. The actual knowledge processes occurring in Firm X, however, contradict this top management perception. The assessment of the H/V ratio indicates that its value is clearly less than one. According to the theoretically predicted value, it appeared Firm X cannot be considered yet as an internal network. Firm X primarily uses vertical knowledge flows to disseminate knowledge throughout the firm.

Ferlie and Pettigrew (1996) suggest that, during the transition from traditional organizational forms to network forms, managerial processes should include 'mixed modes of management,' using hierarchical, market, and network-based styles of management concurrently. Grounded in the case study data is that the cognitive maps of managers may serve as barriers to the transition to the N-form. The CEO's perception that Firm X has been a network organization for a long time indicates the applied strategic logic (Sanchez and Heene, 1996) with regard to organizational form. Although the *structure* of Firm X at first sight resembles an internal network, the case study revealed the *knowledge* and *management* processes do not. Rather, Firm X resembles more a hierarchical organization or a by the central organization dominated network than an internal network of mutually dependent local units. In a similar vein, the cognitive maps of managers used to work in hierarchical organizations are also incongruent with those required to operate in internal network forms.

Therefore, a transition to the N-form not only requires a shift in managerial processes but also in managerial cognitions and therefore in strategic logic (Sanchez and Heene, 1996; Dijksterhuis et al., 1999).

In addition to management's perceptions regarding knowledge flows, as has been done in our analysis, future research should also take into account the actual knowledge flows within an internal network organization. Clearly, the H/V ratio can also be used for this purpose as long as the horizontal and vertical knowledge flows are measured on a similar scale. It therefore has the potential to be a valuable assessment criterion for internal network-based forms as competence, though a single number cannot justify the complexity of an organizational form. Furthermore, it would be interesting to include interorganizational knowledge flows into the investigation regarding internal network-based forms to see how and why firms used to cooperate internally and having an internal network structure, also cooperate externally with firms outside their boundaries. Extending the work of Sivula, Van den Bosch, and Elfring (1997), special attention should be given to the question of why internal networks are set aside specifically for that purpose.

Furthermore, in future research both organizational and managerial supportive factors and barriers to horizontal knowledge flows have to be investigated as well. By considering these factors and barriers and the relationship with the associated managerial competence, we might further discover the intricacies of internal networks, and the managerial competence involved. Another issue deserving attention is the relationship between a firm's absorptive capacity, that is the capacity of firms to identify, assimilate and exploit new external knowledge (Cohen and Levinthal, 1990) and various organization forms and combinative capabilities. Van den Bosch, Volberda and De Boer (1999) provide preliminary findings regarding this relationship. Van Wijk, Van den Bosch and Volberda (1999) elaborate both theoretically and empirically the relationship between a firm's absorptive capacity and internal network forms of organizing and show how internal networks enhance a firm's capacity to absorb new external knowledge. Finally, assuming a dynamic business environment in which internal network-based forms appear to prosper, an interesting avenue for future inquiry might also be the relationship between the H/V ratio and the exploration/ exploitation ratio (March, 1991; Van Wijk, Van den Bosch, Volberda, 1999). Similarly, the investigation of the relationship between the H/V ratio and the "knowledge creation performance" of a firm, measured in terms of speed of innovation, and performance in general might be of great importance.

This paper has demonstrated how and why the proposed H/V ratio can be of help, both for managers and researchers, in assessing the extent, and the move towards or away from operating with internal networks and the associated managerial competence building efforts. This is also helpful for criticizing popular management fads like “flatten the structure” and for providing evidence that managerial competence matters (Penrose, 1959; Hilmer and Donaldson, 1996). More empirical evidence regarding the creation of N-forms and the managerial competence involved will certainly stimulate further theoretical research into the challenging organizational, managerial, and knowledge issues of internal networks and their impact on the creation of new competences.

NOTES

[1] For reasons of confidentiality, the object of the case study is labeled 'Firm X' or 'X.' In order to remain anonymous, references are omitted for citations made by organizational members in either interviews or magazines.

[2] The question in the questionnaire to which we refer here is 'To what extent does your local unit share knowledge with':

- headquarters and subsidiaries — a small extent 1 - 2 - 3 - 4 - 5 a large extent
- other local units — a small extent 1 - 2 - 3 - 4 - 5 a large extent

[3] The significance of the mean differences is computed by adding/subtracting the standard error (corrected by the fpc factor) of the means multiplied by the *student t*'s value at the 99% confidence interval with 41 degrees of freedom (t_{41}=2.70) from the consecutive mean. Execution of this computation at the 99%-confidence interval indicates that the means, addressed at the population level, for vertical and horizontal knowledge flows are the standard normal distribution intervals of <3.76? 0.270> and <2.49? 0.324> respectively. This illustrates that no overlappings exist, and that the means differ significantly.

[4] The standard normal distribution of Firm X's H/V-ratio is computed by dividing the 99%-confidence interval of the means of the perceived incidence of horizontal and vertical knowledge flows (see Table 1).

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Figure 1

Vertical and Horizontal Knowledge Flows within Firm X

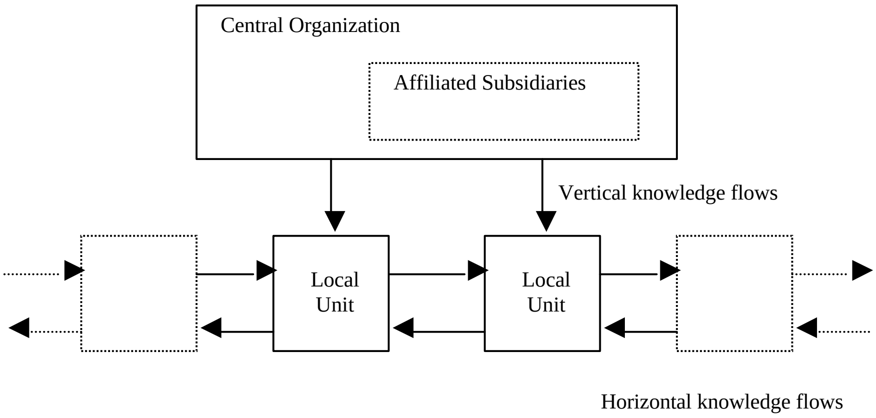

TABLE 1:

The Perceived Incidence of Vertical and Horizontal Knowledge Flows at Firm X.

	Mean	***Standard Error***
Perceived incidence of vertical knowledge flows (top-down; uni-directional)	3.76	.10
Perceived incidence of horizontal knowledge flows (lateral; multidirectional)	2.49	.12

N=42; Since the population of local units of Firm X is finite, the standard errors of the mean have been corrected by the finite population correction (fpc) factor.

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