

The Influence of Managerial and Organizational Determinants of Horizontal Knowledge Exchange on Competence Building and Competence Leveraging

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ERIM REPORT SERIES <i>RESEARCH IN MANAGEMENT</i>	
ERIM Report Series reference number	ERS-2005-080-STR
Publication	December 2005
Number of pages	39
Persistent paper URL	
Email address corresponding author	tmom@rsm.nl
Address	Erasmus Research Institute of Management (ERIM) RSM Erasmus University / Erasmus School of Economics Erasmus Universiteit Rotterdam P.O.Box 1738 3000 DR Rotterdam, The Netherlands Phone: + 31 10 408 1182 Fax: + 31 10 408 9640 Email: info@erim.eur.nl Internet: www.erim.eur.nl

Bibliographic data and classifications of all the ERIM reports are also available on the ERIM website:
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RESEARCH IN MANAGEMENT

ABSTRACT AND KEYWORDS	
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Free Keywords	Competence Building, Competence Leveraging, Exploration & Exploitation, Horizontal Knowledge Flows, Novartis
Availability	The ERIM Report Series is distributed through the following platforms: Academic Repository at Erasmus University (DEAR), DEAR ERIM Series Portal Social Science Research Network (SSRN), SSRN ERIM Series Webpage Research Papers in Economics (REPEC), REPEC ERIM Series Webpage
Classifications	The electronic versions of the papers in the ERIM report Series contain bibliographic metadata by the following classification systems: Library of Congress Classification, (LCC) LCC Webpage Journal of Economic Literature, (JEL), JEL Webpage ACM Computing Classification System CCS Webpage Inspec Classification scheme (ICS), ICS Webpage

**THE INFLUENCE OF MANAGERIAL AND ORGANIZATIONAL
DETERMINANTS OF HORIZONTAL KNOWLEDGE EXCHANGE ON
COMPETENCE BUILDING AND COMPETENCE LEVERAGING**

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Rotterdam, November 2005

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ABSTRACT

Both in theory as in practice insight is limited about how firms in dynamic environments could organize to manage concurrently both the strategic processes of competence building and competence leveraging. To contribute to this issue, a conceptual framework is developed which considers the ability to exchange knowledge across organization units as a prerequisite for firms to achieve both the goals of competence building and leveraging. The framework shows how several important managerial and organizational determinants, associated with cross-unit knowledge exchange, may stimulate competence-building processes and how they may stimulate competence-leveraging processes. The conceptual framework will be illustrated by two case studies in different contexts of Novartis, one of the leading European life-science companies. These two contexts of respectively ‘organization-enabled’ and ‘web-enabled’ knowledge exchange appear to be complementary. The conceptual framework and cases provide insight into (1) possibilities about how firms could organize to deal with the tension between competence building and leveraging processes, and (2) how managing the determinants of horizontal knowledge exchange can contribute to changing a firm’s actual mixture of competence building/leveraging processes into a more desired strategic mixture.

Keywords: competence building; competence leveraging; exploration & exploitation; horizontal knowledge flows; Novartis.

INTRODUCTION

The most fundamental question in strategy, both from a researcher and practitioner point of view, is probably why and how firms are successful over time. The competence-based view argues that whether a firm will gain and maintain competitive advantage is to a large extent determined by its ability to manage concurrently both the processes of competence building and competence leveraging (Sanchez & Thomas, 1996). We associate competence building with qualitative changes in the firm's existing stock of competences, and with changing the status quo by creating new strategic options for future action (cf. Sanchez, Heene, & Thomas, 1996, p. 8). Competence leveraging will be related to using or quantitatively changing existing competences, and to exercising existing options for actions (cf. Sanchez et al., 1996, p. 8).

The need to both build and leverage competences is most apparent in dynamic industries, for example, the life sciences (Mom, 2001), the multi media industry (De Boer, Van Den Bosch, & Volberda, 1999; Roos & Von Krogh, 1996) and the financial services sector (Flier et al., 2001; Flier, Van Den Bosch, & Volberda, 2003). Firms in such industries continuously need to renew themselves to ensure profits for tomorrow by building new competences. At the same time these firms are confronted with competitive forces that compel them to make profits today by leveraging existing competences.

However, managing concurrently the processes of competence building and leveraging appears both in theory – especially from the organizational learning literature (e.g. March, 1991; Levinthal & March, 1993) – and in practice to be difficult for firms (Jansen, Van den Bosch, Volberda, 2005). Apparently, there is a tendency for firms to fall into a

‘competence trap’ (Leonard-Barton, 1992), or into a ‘failure trap’ (Levinthal & March, 1993). This is among others due to the fact that revenues from building new competences are more distant in time and less certain as compared to revenues from leveraging activities. More theoretical and practical insight is needed into how firms could deal with these paradoxical or even conflicting strategic issues (Hamel & Heene, 1994; Volberda, 1998). Or as Sanchez et al. (1996, p. 4) express it: insight is needed into ‘how firms competing in environments that demand both competences simultaneously might organize to reconcile the conflicts that such seemingly opposing competences might create within the firm.’

As knowledge has emerged as the most strategically significant resource of the firm (Grant, 1996b; Sanchez & Heene, 1997), this chapter argues along with other authors that knowledge processes, and especially horizontal knowledge exchange within a firm (Hedlund, 1994; Nohria & Goshal, 1997; Van Wijk & Van Den Bosch, 2000), plays an important role for managing the above-described competence building/leveraging problem. Horizontal knowledge exchange takes place between divisions, between business units and between operating units. Vertical knowledge exchange is being associated with the vertical lines of hierarchy and follows a top-down or bottom-up direction (Van Den Bosch & Van Wijk, 1999).

Horizontal knowledge exchange may contribute both to competence building and leveraging processes within the firm. New strategic options and qualitative changes in a firm’s existing stock of assets and capabilities may be created through cross-fertilization of knowledge across an organization’s units and new knowledge combinations based on existing knowledge (Grant, 1996a; Kogut & Zander, 1992). The argument for leveraging may, for instance, be illustrated by the study of Szulanski (1996) about the internal transfer of

best practices. Szulanski argues that firms engage in the cross-unit transfer of best practices to improve knowledge utilization within the firm, to avoid the duplication of effort and ‘in this sense, transfers of best practice could be conceived as replications of organizational routines’ (1996, p. 28). Utilization, duplication, and replication of knowledge assets lead to quantitative changes in stocks of like-kind assets within the organization and as such can be associated with leveraging competences at organizational level (Sanchez et al., 1996).

The goal of this chapter is to create an insight into how a firm could change its actual mixture of strategic competence building/leveraging processes into a more desired mixture, and how firms might organize to deal with the associated conflicts between these processes. The focus will be on the role of horizontal knowledge exchange, by addressing as research question: *‘How and why do key managerial and organizational determinants of horizontal knowledge exchange contribute to both competence building and competence leveraging processes?’*.

To address this research question we have developed an integrated conceptual framework. The framework is based on the literature and will in particular focus on the process dimension of horizontal knowledge exchange. Subsequently, several key managerial and organizational determinants of the various phases of the knowledge exchange process are analyzed. We will develop propositions relating these determinants to the knowledge exchange process in terms of competence building and competence leveraging. The empirical and managerial applicability of the conceptual framework will be illustrated by two related case studies of horizontal knowledge exchange efforts of a European life-science multinational. In the first case, we will focus on competence building by investigating the organizational and managerial determinants of inter-division knowledge exchange. The

second case deals with competence leveraging. Based on the suggested process framework we will investigate the role of information and communication technology (ICT) in this respect. Finally, we will discuss the findings.

THE PROCESS OF HORIZONTAL KNOWLEDGE EXCHANGE: PHASES AND DETERMINANTS

The horizontal exchange of knowledge between organization units can be considered as an unfolding process with different phases. To identify these phases and the particular characteristics of each of them, we integrate three previously developed models of intra-corporate knowledge and exchange: [Von Krogh and Koehne \(1998\)](#), [Boone \(1997\)](#), and [Szulanski \(1996\)](#). Identifying the managerial and organizational determinants of the various phases of the integrated framework will be the next step of the conceptual analysis.

The Three Phases in the Process of Horizontal Knowledge Exchange

Knowledge exchange between persons, groups, departments, units, and divisions of the same organization can be considered and analyzed as a process consisting of three phases: the initiation phase, the flow phase, and the integration phase (Initiierungsphase, Wissenflussphase, Integrationsphase) [Von Krogh and Koehne \(1998\)](#). The initiation phase is characterized by the wish, will, and goal of people, groups or organization units to transfer knowledge. According to [Von Krogh and Koehne \(1998\)](#), the most important challenge in this phase is finding and identifying the appropriate knowledge and involving those who own the knowledge into the transfer of the knowledge. During the flow phase, the explicit and tacit knowledge flows between those involved by interaction and communication. The

integration phase starts when the recipient receives the knowledge and puts it into use. Von Krogh and Koehne (1998) point out that the recipient first assesses the transferred knowledge into his environment based on his experiences and own knowledge base and then applies the knowledge and assimilates it.

Boone (1997) develops a two-phase process model of internal cross-unit knowledge exchange. The model contains a decision and an execution phase. The decision phase is about the willingness and decision process of the potential knowledge donor and acceptor about sharing knowledge: 'besides the donor being willing to share his or her knowledge, potential recipients have to make up their mind with respect to their eagerness to adopt, apply, and integrate a particular knowledge item' (Boone, 1997, p. 47). During the execution phase the knowledge is being transferred. These two phases correspond closely with the 'Initiierungsphase' and 'Wissenfluss- phase' of Von Krogh and Koehne (1998). Boone does not focus explicitly on the application of the transferred knowledge by the recipient.

The literature about the transfer of best practices also provides clues for our framework. For example, Szulanski (1996, p. 28) conducted an interesting quantitative empirical research in that field with the goal 'to investigate the origins of internal stickiness of knowledge transfer'. He uses a four-stage process model to characterize the internal transfer of knowledge. The stages of this model (initiation, implementation, ramp-up, and integration) correspond closely with the phases of the model of Von Krogh and Koehne (1998) and the model of Boone (1997). His initiation stage is about deciding to start the transfer, like the initiation phase of Von Krogh and Koehne and the decision phase of Boone. During the implementation stage of Szulanski, the knowledge flows between the recipient and the source like the flow phase and execution phase of the previous authors. In the ramp-

up stage the best practice is put into use and in the integration stage the knowledge becomes routinized; this is what happens in the integration phase of Von Krogh and Ko'ne.

By integrating the models of the above-mentioned authors, it can be concluded that the exchange of knowledge within an organization between persons, groups, and organization units can be described as a process comprising three phases. First, a Decision Phase which comprises all activities that enable the potential donor and recipient to decide to start exchanging knowledge. Second, a Transfer Phase in which resources are being allocated to actually transfer the knowledge and finally an Absorption Phase where the recipients assimilated the newly received knowledge and starts using it.

Fig. 1 depicts our conceptual framework.

Insert figure 1 about here

Managerial and Organizational *Determinants of Horizontal Knowledge Exchange*

Besides the three identified phases of the process of horizontal knowledge exchange, Fig. 1 shows the managerial and organizational determinants that are assumed to influence these phases. The upper panel of Fig. 1 indicates how the determinants may stimulate the process of horizontal knowledge exchange conducive to competence building, and the lower panel with respect to competence leveraging.

All authors as mentioned above give an overview of factors or determinants, which may influence the phases of the horizontal knowledge exchange process within an

organization. Boone (1997, pp. 55–118) provides the most extensive overview of the potential stimulating and inhibiting factors concerning the Decision and Transfer Phases. The factors that Von Krogh and Koehne (1998, pp. 242–248) and Szulanski (1996, pp. 33–32) briefly describe are all extensively dealt with by Boone (1997) as well.

Boone (1997) argues that for the *Decision Phase* both awareness- and interest-related factors play a role. He identifies several awareness- and interest- specific barriers that need to be reduced and eliminated by the use of management systems and tools. Awareness-related factors hinder or stimulate a potential knowledge recipient to become aware of where the knowledge resides that could be used to solve problems or to explore new opportunities. Likewise, ‘donors looking for application opportunities of their knowledge need to be aware where their knowledge is needed’ (Boone, 1997, p. 48). ‘Tacitness of knowledge’ is an example of an awareness-related barrier. Tacit knowledge remains in many cases difficult to abstract and hence extremely hard to locate and exploit (Nonaka, 1994). A way to tackle this barrier could be to codify, register, and store such knowledge according to Boone. Interest-related determinants are about the ‘willingness to participate in the transfer of a knowledge item’ (Boone, 1997, p. 71). An example of a barrier is ‘efficiency rationales’ (p. 72); if the exchange of knowledge is assumed to have a negative trade-off between costs and benefits for either the donor or recipient, one of them might withdraw to engage in the transfer. Boone (1997, p. 79) suggests tackling this barrier by financial measures and rewards systems.

In the *Transfer Phase*, transfer mechanisms play an important role. Boone (1997, p. 51) indicates that ‘one needs to study the complexity of the particular situation and decide upon the most suitable transfer mechanism to be used for the effectuation of the knowledge transfer. (y) There needs to be a fit between the nature of the knowledge item and the

richness of the transfer medium'. What further matters during this phase according to Boone is the extent of trust between the parties involved, the amount of resources allocated to the knowledge exchange activities, and the skills of the firm's employees to deal with transfer mechanisms.

During the *Absorption Phase*, the recipient assimilates the knowledge and starts using it. Cohen and Levinthal (1990) call the ability of a firm to assimilate and apply new knowledge 'absorptive capacity'. By shifting the unit of analysis from the organizational to the intra-organizational level it can be argued that the success of the final phase of the knowledge exchange process is determined by the 'absorptive capacity' of the recipient. Cohen and Levinthal (1990, p. 128) consider the level of prior related knowledge as the determinant of absorptive capacity: 'At the most elemental level, this prior knowledge includes basic skills or even a shared language but may also include knowledge of the most recent scientific or technological developments in a given field'. Based on this, Van Den Bosch, Volberda, and De Boer (1999) and Van Den Bosch, Van Wijk, and Volberda (2003) suggest two specific organizational determinants of absorptive capacity: 'organization forms' and 'combinative capabilities'. An organization form is viewed here 'as a type of infrastructure, which in a specific way enables the process of integrating knowledge' (1999, p. 554). We will leave out combinative capabilities (see Jansen, Van den Bosch, Volberda, 2005) in this chapter because the previously discussed determinants contain various aspects of combinative capabilities.

PROPOSITIONS ABOUT THE IMPACT OF KNOWLEDGE EXCHANGE
DETERMINANTS ON COMPETENCE LEVERAGING AND BUILDING

In the Decision Phase of the knowledge exchange process, Awareness-related factors hinder or stimulate a potential knowledge donor or recipient to become aware of where in the organization knowledge is needed or resides. We argue that awareness facilitators conducive to competence building are ‘qualitatively more advanced’ as compared to those conducive to competence leveraging: in the case of competence building, the awareness facilitators should be able to reduce the cognitive limits managers face when they search for qualitatively unrelated knowledge and the associated causal ambiguities when deciding about the potential value of integrating such knowledge into the existing organization-unit’s knowledge base. In the case of competence leveraging, the knowledge being exchanged is often less ambiguous and better quantifiable (Sanchez & Heene, 1996); it is associated with quantitative changes in the unit’s existing competences. While knowledge codification, registration, and storage and internal standardized benchmark procedures seem more suited to detect related knowledge (Boone, 1997; Von Krogh & Kohne, 1998), for identifying and interpreting qualitative unrelated knowledge qualitatively more advanced awareness facilitators are needed like, for example, cross-unit personal networks, job rotation, and meetings. These considerations give rise to the following proposition:

Proposition 1. *In the Decision Phase of the horizontal knowledge exchange process, awareness facilitators conducive to competence building are ‘qualitatively more advanced’ as compared to those conducive to competence leveraging.*

The second determinant of the Decision Phase, Interest, is about the willingness of the units to participate in knowledge exchange activities. At first sight, it seems that the donor unit only could lack interest because of such reasons as a possible negative trade-off between costs and benefits, an assumed loss in power base or fear for inter-unit competition (Boone, 1997). It seems, however, that stimulating the interest of the recipient unit becomes important as well in the case of knowledge exchange aimed at competence building. The underlying reason being that the benefits related to competence building are less certain and more distant in time for the knowledge recipient, as compared to benefits coming from competence leveraging. These considerations give rise to the following proposition:

Proposition 2. *In the Decision Phase of the horizontal knowledge exchange process, stimulating the interest of the recipient unit is more important for competence building, whereas stimulating the interest of the donor unit is more important for competence leveraging.*

During the transfer phase, transfer mechanism related factors play a role. Competence building is associated with higher uncertainty and higher complexity than competence leveraging because desired and possible outcomes are unclear. Therefore, we argue that knowledge exchange aimed at competence building requires more ‘media richness’ than competence leveraging. Media richness can be defined as ‘the communication medium’s capacity to exchange mental representations within a specific time interval. It has two underlying dimensions – the variety of cues that the medium can convey and the rapidity of feedback that the medium can provide’ (Huber, 1991, p. 103). The argument is also based on

the assumption that the ‘qualitative changes in the existing stocks of assets’ (competence building, cf. Sanchez et al., 1996, p. 8) are related to the exchange of tacit knowledge whereas the ‘quantitative changes in stocks of like-kind assets’ (competence leveraging, cf. Sanchez et al., 1996, p. 8) are related to the exchange of explicit knowledge. The transfer of tacit knowledge requires mechanisms which allow for more intense, frequent, open, and dense communication and personal interactions as compared to the transfer of explicit knowledge (Boone, 1997; Gupta & Govindarajan, 1991, 2000). These considerations lead to the following proposition:

Proposition 3. *In the Transfer Phase of the horizontal knowledge exchange process, the transfer-mechanisms contain more ‘media richness’ in the case of competence building as compared to competence leveraging.*

The first determinant of the Absorption Phase is considered to be the level of prior related knowledge of an organization unit (Cohen & Levinthal, 1990). Cohen and Levinthal (1990) associate a higher level of prior-related knowledge with a higher level of absorptive capacity. It seems useful, however, to distinguish between the level of depth and breadth of the knowledge base (Van Wijk, Van Den Bosch, & Volberda, 2001) for understanding how an organization’s knowledge base could offer potential for the exchange of knowledge conducive to competence leveraging versus building. Cohen and Levinthal (1990, p. 150) point out that, for an organization unit to be able to absorb knowledge from unrelated domains, the unit needs first to acquire the requisite breadth of knowledge. As such, an increase in the breadth of an organization unit’s knowledge base can be assumed to increase

the potential of that unit to build new competences. An increase in depth of the knowledge base offers an increased potential to leverage-related competences. These considerations lead to the following proposition:

Proposition 4. *In the Absorption Phase of the horizontal knowledge exchange process, an increase in the breadth of the knowledge base of an organization unit increases the potential for that unit to build competences, whereas an increase in the depth of the knowledge base increases the potential for that unit to leverage competences.*

The last determinant of the Absorption Phase is the Organization Form. De Boer et al. (1999) and Van Den Bosch et al. (1999, 2003) provide a rationale for the impact of several basic organization forms on the ability of the organization to absorb knowledge. They assume that organization forms like the matrix-form offer potential to absorb knowledge conducive to the exploration of the organization's competence base, while organization forms like the functional-form offer potential for exploiting existing competences. These considerations lead to the following proposition:

Proposition 5. *In the Absorption Phase of the horizontal knowledge exchange process, a matrix or innovative organization form offer most potential to build competences, whereas a functional or divisional organization form offer most potential to leverage competences.*

CASE COMPANY AND RESEARCH METHODOLOGY

To illustrate the empirical applicability of the framework, case research has been performed within Novartis. Founded in 1996 as the result of a merger of Ciba and Sandoz, Novartis nowadays is active in the life-sciences industry in over 140 countries. With sales of US\$ 25 billion, US\$ 5 billion net income, and US\$ 3.8 billion R&D expenses over 2003, Novartis is the second largest pharmaceuticals companies in Europe (cf. Forbes, 2003). Regarding the selection of this industry, several challenges in the life-science industry provide an interesting context to investigate abilities to build and leverage competences for firms who want to survive and succeed in the industry. Increased competition, changing legislation, and fast technological developments force the incumbents to strategic renewal (Volberda, Baden-Fuller, & Van Den Bosch, 2001). The average life cycle (from launch to catch up by competitor) of a life-science product becomes constantly shorter (Chiesa, 1996; Stuehn, 1999) from 10 to 6 years in the 1970s to 2 to 1 years in the 1990s. Increasing competition and more diverse and faster technological development are major forces driving this trend. A new challenge in the industry is posed by the fact that the various domains and technologies of the life sciences like, for example, pharmacology, botany, and zoology become more and more overlapping and innovations increasingly take place by cross-fertilization between different domains. However, in the large multi-unit firms, these domains are grouped in separate divisions or units. Other pressures, like shareholder value creation, force the firms to focus on short-term costs and profits and demand an efficient deployment of their current competences. While there is an increased pressure on prices and margins on life-science products (Stuehn, 1999), research and development expenses are very substantial and are

increasing year after year. R&D expenses of, for example, Novartis increased from 10 percent of total revenues in 1990 to 13 percent in 2001.

Methodology

Two case studies were conducted in 2000. The first study is mainly about how the determinants of the conceptual framework of this chapter influence knowledge exchange across Novartis' divisions aimed at competence building. The second case study shows how the identified determinants influenced an initiative of corporate knowledge management to stimulate, in particular, competence leveraging throughout Novartis with the help of the company's intranet.

The first case study is mainly based on interviews with top and middle managers in the areas of research, development, and knowledge management. This choice is made because of the central role of top and especially of middle management with respect to inter-unit knowledge exchange (Nonaka & Takeuchi, 1995; Van Den Bosch & Van Wijk, 1999) and the importance of research and development in the life-science industry. The interviews were conducted in the period of April to June 2000. The analysis focuses on two of the – at that time seven – divisions of Novartis, namely Pharma and Animal Health. The Pharma division is the most important division of Novartis in terms of sales (60 percent of total sales), profits (80 percent of total profits) and R&D expenses (69 percent of total R&D). The Animal Health division is the youngest and fastest growing division (4 percent of total sales, 3 percent of total profits and 2 percent of total R&D). These numbers apply to the year 2000.

A sample of 11 respondents was composed with the help of Corporate Knowledge Management on the basis of their knowledge concerning the topic addressed in this chapter.

Eight of them are division managers in the areas of research, development, and knowledge management. The remaining three are corporate managers. Semi-structured interviews were conducted and recorded by notepad and pencil. When further clarification was needed, follow-up interviews were conducted. Other empirical data of Novartis for this case has been gained during inter- and intra-divisional meetings concerning knowledge management, internal lectures, and presentations concerning the topic of this research, the Novartis Intranet and internal company documents.

The second case study concerns an experiment of Corporate Knowledge Management to stimulate the corporate-wide leveraging of existing competences by an intranet-based knowledge-sharing conference. The event took place at the same time as the interviews for the first study were held. The framework as developed in this chapter and shown in [Fig. 1](#) was used to guide the preparation, conduct, and evaluation of this conference.

CASE 1: DETERMINANTS OF HORIZONTAL KNOWLEDGE EXCHANGE AIMED AT COMPETENCE BUILDING

The need to exchange knowledge across units is recognized by senior management, as the following quote from an interview emphasizes: ‘Sharing knowledge across divisions becomes increasingly important for us. Take for example the functional foods in the industry; they actually are the result of cross-fertilization between pharmaceutical and ‘normal food’-knowledge’.

Impact of the Determinants during the Decision Phase

It appeared from the interviews that both the potential knowledge donor and the recipient consider it very difficult to find out where potential knowledge exchange possibilities are situated within the organization. All interviewed division managers said that personal contacts between people of various divisions are very limited and that this lack of personal contact seriously hinders the awareness of cross-division knowledge exchange opportunities (see [Box 1](#), quote 1).

It further turned out that awareness might be hindered because of employees who might be unwilling to give insight of their knowledge when it is being considered as a personal property or as a power base (see [Box 1](#), quote 2). Another reason for a lack of awareness concerning cross-division competence- building possibilities might be related to the high level of tacit knowledge in use at the divisions (see [Box 1](#), quote 3). Tacit knowledge is hard to detect, formulate, and communicate (Nonaka, 1994).

Insert box 1 about here

In 1996, Corporate Knowledge Management took an initiative to increase the awareness about cross-division knowledge exchange possibilities; the YellowPages. The YellowPages is an electronic database containing summaries of knowledge and expertise of individual associates of Novartis. Although there is a lack of 'awareness', all division

managers but one, indicated that the YellowPages are not really being used. People have entered their knowledge into the YellowPages, but do not contact each other and ask for explanations, experiences, knowledge, etc. When asked why the YellowPages are not really used, the interviewees indicated that the personal contact is missing when using the YellowPages.

Other reasons for the lack of cross-division knowledge exchange initiatives within Novartis seem to be related to the interest determinant. Six of the eight division managers indicated that cooperation with respect to knowledge sharing is received well by their division or other divisions, but is not actively searched. Three reasons were found during the interviews. The most important reason for not being willing to engage in a knowledge exchange activity is that acting as a donor is assumed to take time that cannot be spent for profitable activities. This is an example of an efficiency rationale in terms of Boone (1997). Opposition by the donor because of personal reasons (no reward, knowledge considered as a power base or a personal property) and opposition by the receiving division because of fear to lose independence also play a role. The underlying reason for both the efficiency rationale of the donor-divisions and the fear of the recipient-division could be the need for every division to run its business independently of others and the responsibility to make its own profit (see Box 1, quote 4).

Corporate Knowledge Management tries to increase the interest for cross-division knowledge exchange among the divisions and their associates. They mainly do this by demonstrating their commitment regarding such knowledge exchange activities to the division managers and scientists. Posters and brochures can for instance be found throughout the company showing slogans of the CEO, encouraging scientists and managers to have an

open attitude toward each other and to share knowledge with each other, for example, ‘our success in building a high performance organization will also be based on the capability of sharing and exploiting or professional knowledge better and faster than our competitors’ (company brochure, Novartis, 1998).

Impact of the Determinants during the Transfer Phase

Regarding the Transfer Phase, two units within Novartis aim at stimulating the transfer of knowledge between divisions. These units are the Research Advisory Board and the technology Advisory Board. Top managers in the field of research, development, and other disciplines of all the divisions have a seat in these boards. The goal of both boards is to launch, finance, and monitor long-term, explorative, cross-division projects. About 10 projects were initiated in 1999. All interviewees recognized these roles of the boards (see [Box 2](#), quotes 1 and 2).

The interpersonal relations stimulated by the Boards and the exploratory nature of the projects funded and coordinated by them, matches with the high need for tacit knowledge of the divisions and their focus on exploring knowledge. There seems to be a fit between the nature of knowledge in use (tacit) and the goal of the knowledge transfer activity (new competence building) on one hand and the richness of the transfer mechanism on the other hand. It should be remarked, however, that the Boards do not directly bring the divisions’ operational managers and scientists together; only top management of the divisions are involved in these activities. Since 1996, Corporate Knowledge Management experiments with the possibilities the Novartis’ intranet offers to transfer knowledge between ‘people at

the front’, the scientists. One of these possibilities may be offered through the organization of web-based conferences. This is what the second case study will be about.

Insert box 2 about here

Impact of the Determinants during the Absorption Phase

During the final phase of the model, the transferred knowledge is being absorbed and put into use by the recipient. A difference between the Pharma and Animal Health division appeared in this phase. The interviewed managers of Pharma indicated that they actually hardly absorb knowledge from other divisions (see [Box 3](#), quote 1). If their division engaged in cross-division knowledge exchange, they almost always acted as a donor and not as a recipient. The managers of the Animal Health division indicated that their division acts mostly as a knowledge recipient (see [Box 3](#), quote 2). This corresponds with the assumption of the Senior Officer Corporate Knowledge Management that ‘Animal Health is assumed to use more than the other divisions knowledge from other divisions’.

Insert box 3 about here

During the case study research, we were able to substantiate this observation by developing an indicator of the breadth of knowledge in a particular division. The analysis of all the product and therapeutic areas of all the divisions of Novartis shows that about 67 different scientific and technological disciplines such as Gene Technology, Microbiology, Chromatography, etc. lay at the basis of the life-science products. Some divisions use most of these disciplines as, for example, the Pharma division (about 52 of the 67), while other divisions use a limited number of these disciplines as, for example, the Animal Health (about 19). If the number of scientific and technological disciplines within a certain division are considered to be an indicator of the breadth of the knowledge base of that division, then it could be plainly stated that '67' is the maximum breadth of knowledge a division could reach through cross-division knowledge exchange activities. In that sense, Animal Health has more potential to increase its breadth of knowledge base by absorbing knowledge from other divisions than Pharma has. Fig. 2 shows graphically the number of scientific and technological disciplines in use at Pharma and Animal Health as a part of the total number of disciplines in use at Novartis.

Insert figure 2 about here

The Pharma division used in the period investigated a functional organization form. Such an organization form enables economies of scale, but the potential for scope and flexibility of knowledge exchange is rather low because of communication difficulties

between the functions (Volberda, 1998, p. 138; De Boer et al., 1999). The organization form of the Animal Health division relates to the ‘innovative form’ (Volberda, 1998, p. 140). This organization form possesses a high potential for both exploring and exploiting knowledge. As De Boer et al. (1999, p. 384) pointed out: ‘the underlying principle of the innovative form is, (y), to gather currently profitable, established product markets into a current business group and to place the development of new product-market positions into a team based innovation group. Thus the innovation group focuses on increasing the scope and flexibility of knowledge integration, while the current business exploits its efficiency of knowledge integration’

CASE 2: DETERMINANTS OF HORIZONTAL KNOWLEDGE INTEGRATION AIMED AT COMPETENCE LEVERAGING

Introduction

Being aware of how difficult inter-division knowledge exchange takes place in the organizational setting as described in the first case, Corporate Knowledge Management experiments with possibilities to stimulate knowledge exchange throughout the company with the help of the Novartis intranet. The ‘virtual forum’ is an electronic platform at the intranet where group discussions and conferences take place about specific themes, problems, and products between scientists of Novartis from various divisions, countries, functions, and background. During the period of the research, an electronic conference was organized and moderated by Corporate Knowledge Management, the first author of this chapter and the head of a unit in the Pharma Division. This unit delivers analysis tools, databases, and

information sources to the scientists of the Pharma division and is located at Basel, Switzerland. Some general information about this conference can be found in [Box 4](#).

Insert box 4 about here

For two reasons it can be argued that the main aim of this knowledge-sharing event was the leveraging of existing competences. First, because the goal of the conference was, for the organization unit, to gain information and ideas coming from the Pharma scientists from all over the world to improve their products and to find new opportunities for applications of their existing products. Second, because mainly explicit knowledge was being exchanged in the form of written documents, data, drawings, tables, etc. This inspires us to contrast this case with the previous one, which was mainly about intra-corporate competence building. To facilitate this comparison, it was decided to organize the conference with the help of and along the theoretical framework as developed in this chapter. What specific managerial and organizational determinants for the phases of the knowledge exchange process were identified is shown in the following sections. The Decision and Transfer Phases are emphasized because these two phases could be finished within the limited time period of the research (from April to June 2000).

Impact of the Determinants during the Decision Phase

The level of awareness and interest determine the success of the Decision phase according to the framework in Fig. 1. Thiesse and Bach (1999) mention as the most important factor why people are reluctant or unwilling to participate in ICT-related knowledge sharing tools such as an electronic conference, a lack of trust because people don't know each other and/or the tool. To increase trust, a physical conference setting was replicated to make the conference more familiar; there was a 'bulletin board', a 'plenum room' and various 'break out rooms'. A kind of community feeling was created among the participants – who indeed did not know each other – by sending announcements and newsletters only to a selected limited number of (about 180) people, all who were familiar with the products of the group. Finally, a short video-clip where the head of the product-group presents him and the conference provided the conference with a 'friendly face'. According to Jansen and Bach (1999), a certain critical mass of participants is continuously needed during a web-based conference. This means that potential participants have to be made continuously aware of and interested in the conference. To achieve this, before and during the conference, several informative and motivating newsletters, signed by Pharma middle managers, were sent to the potential participants to raise their awareness and interest about the conference to motivate them to visit the conference several times and to stimulate those people who had not come yet, still to visit. Fig. 3 shows the impact of these newsletters. All substantial increases in visits and readings took place within 24 h after a newsletter had been sent.

Insert figure 3 about here

Impact of the Determinants during the Transfer Phase

Transfer mechanisms-related factors determine the success of the second phase of the framework. Farag (1998, p. 46) mentions a limited ability to communicate with each other as a typical barrier for a transfer mechanism as an electronic conference. People can face difficulties in transferring knowledge via the medium because there is a limited ability to interact; they do not see and hear each other and the discussions are asynchronous. For this reason, about ten middle managers of the Pharma division were asked to act as ‘challengers’ during the Transfer Phase of the conference. Their task was to post some ‘challenging’ documents in the conference’s rooms that provoke discussion and interaction among the participants. Finally, a potential lack of transfer skills to handle the medium among the participants was tackled by providing them with instructions and guidelines about how to subscribe, how to read, post, and comment on documents in the electronic conference.

Fig. 3 can also be seen as a visualization of the knowledge being transferred during the conference. The exchange of knowledge took place by hosting and subsequently downloading explicit knowledge in the form of research data, documents, and pictures. Novartis’ Corporate Knowledge Management considers the conference as successful in terms of participation, interaction, and knowledge exchanged. It is decided to continue to organize and moderate web-based knowledge exchanging. Electronic conferences seem to be a very effective tool for bringing Novartis’ scientists together and make them exchange and use existing knowledge.

DISCUSSION AND CONCLUSION

The goal of this chapter is to increase our insight into how a firm could change its actual mixture of competence building/leveraging processes into a more desired mixture. Furthermore, we are interested in how firms might organize to deal with the associated conflicts between these two strategic processes. To contribute to these issues, a conceptual framework is developed which considers the ability to exchange knowledge across organization units as a prerequisite for firms to achieve both goals of competence building and leveraging. The framework conceptualizes the horizontal exchange of knowledge as a process containing three phases: Decision, Transfer, and Absorption phases. It also indicates how awareness and interest toward knowledge exchange, transfer mechanisms, level of prior related knowledge, and the organization form might influence cross-unit knowledge exchange in terms of competence building and competence leveraging. Several propositions are developed to illustrate the framework. The implicit assumption in this chapter is that a firm could change its actual combination of competence building/leveraging into another, more desired mixture, by changing the identified managerial and organizational determinants of knowledge exchange in the direction as indicated by the propositions.

Two case studies are conducted: the first case is mainly about building competences by recombining knowledge from different divisions. The second case has as a main consequence the leveraging of existing competences by exchanging knowledge across divisions. We will now contrast the two cases and analyze how and to what extent they might illustrate the conceptual framework. We organized this analysis along the five propositions. It is however not our intention to actually test these propositions, as for this future – quantitative – research will be needed.

The first proposition postulates that in the Decision Phase, for competence building, qualitatively more advanced awareness facilitators are required than for competence leveraging. The only awareness facilitator present in the first case is ‘The YellowPages’, an intranet-based electronic database, meant to increase the ability of people to identify knowledge throughout the company. The managers argued, however, that this facilitator is not sufficient for identifying valuable knowledge across divisions when competence building is desired. Personal networks would be the preferred awareness facilitator in that case according to the interviewees. The second case, which is about competence leveraging by exchanging explicit knowledge, shows that the creation of awareness via the intranet did work sufficiently.

The second proposition advances that in the Decision Phase, stimulating the interest of the recipient unit is more important for competence building, whereas stimulating the interest of the donor unit is more important for competence leveraging. The interview results of the first case indicate that serious barriers exist with respect to the willingness of the recipient units to receive knowledge from other divisions. One of the reasons is that the recipient unit fears to lose part of its independence when receiving knowledge from other divisions. In the second case, stimulating only the donor’s interest to participate in the knowledge exchange event appeared to be sufficient for the event’s success.

The third proposition postulates that in the Transfer Phase, the media richness of the transfer mechanisms should be higher in the case of competence building as compared to competence leveraging. In both cases, the transfer mechanisms in use were found to be adequate. The mechanisms in the competence building case (the meetings and projects facilitated by the Research and Technology Advisory Boards) allow for more ‘media

richness' than the mechanism in the leveraging case (the electronic platform that allows only asynchronous interaction and the exchange of explicit knowledge).

The fourth proposition advances that in the Absorption Phase, an increase in the breadth of the knowledge base of an organization unit increases the potential for that unit to absorb knowledge from other units conducive to competence building, whereas an increase in depth is associated with competence leveraging. Management indicated that the Animal Health division is more active in absorbing knowledge from other divisions conducive to competence building than the Pharma division. This can be related to the fact that Animal Health has more opportunities to increase the breadth of its knowledge base by receiving knowledge from other divisions: only 28 percent of all scientific and technological disciplines of Novartis are in use at Animal Health, while 78 percent at Pharma.

The fifth proposition postulates that in the Absorption Phase, a matrix or innovative organization form will be most suited to absorb knowledge aimed at competence building, while the functional and divisional form are most conducive to competence leveraging. It is illustrative in the first case that Animal Health, which absorbs more knowledge than Pharma, has an innovative organization form, while Pharma has a functional form.

Complementary of Organization- and Web-Enabled Knowledge Exchange: Organizing for both Competence Building and Leveraging

At this point we did not yet address explicitly the issue of how firms might organize to deal with the associated conflicts between competence building and leveraging. With respect to this issue, the chapter at first sight seems to favor the conclusion that these processes cannot be synthesized but should rather be separated in place and/or time. This conclusion can be

illustrated with the help of the identified determinants of horizontal knowledge exchange, whose attributes seem to be mutually exclusive for competence building versus leveraging (Fig. 1). Spatial separation is, for instance, illustrated in the literature on internal corporate venturing where a firm develops competence building modes and competence leveraging modes in different portions of the organization (Volberda, 1998). However, there are problems involved as well, for instance, re-assimilating or exploiting the newly created competences into the parent organization (Burgelman, 1983). In the oscillating organization, for example, separation of time takes place by alternating periods of stability with periods of renewal. However, in an environment of frequent change, the oscillating firm has the risk of becoming extremely chaotic or rigid (Volberda, 1998).

Comparing and contrasting the two case studies again might give some interesting preliminary insights into how firms could organize to deal with the tension between competence building and leveraging processes. The serious barriers to cross-division knowledge exchange as found in case 1 stimulated Corporate Knowledge Management to experiment with novel ways to facilitate the corporate-wide use of Novartis' knowledge. The web-enabled knowledge exchange event of case 2 is an example of such an experiment. In the usual organizational setting of Novartis, the awareness and interest concerning cross-division knowledge exchange opportunities is rather low among the scientists and division managers. Case 2 showed, with respect to the stimulation of awareness and interest, the importance of Novartis' division management. In their role of 'challenger', middle management linked the scientists with each other during the electronic conference and created, in that way, awareness among them with respect to opportunities to exchange

knowledge with other scientists. Middle management also continuously created interest and stimulated the employees to exchange knowledge.

Within the organizational setting of Novartis, the Research and Technology Advisory Boards are the 'mechanisms' to transfer knowledge between organization divisions. The interviewees positively valued the boards, especially because tacit knowledge is being exchanged by them and they respond to the high need in the divisions to renew; to build competences. A shortcoming of these boards is that they only bring top managers of the divisions together and only increase their awareness and interest in cross-unit knowledge exchange. Case 2 shows that by the web-enabled knowledge exchange event, the employees (the scientific knowledge workers) as well become aware of and interested in knowledge exchange opportunities, and that they get the tools to exchange knowledge directly with each other. In conclusion, it seems that 'organization-enabled' knowledge exchange (case 1) and 'web-enabled' knowledge exchange (case 2) provide two complementary contexts for horizontal knowledge exchange. While the focus of the first case is on competence building, the main consequence of the second case is the leveraging of existing competences. Furthermore, tacit knowledge was being transferred/absorbed at unit or division level in the first case, while mainly explicit knowledge was being transferred and absorbed at individual level in the second case. As such, the cases might give some preliminary insights into how firms could organize to deal with the tension between competence building and leveraging processes. Therefore, managing the determinants of horizontal knowledge exchange can contribute to a firm's strategic renewal by changing the actual mixture of competence building/leveraging processes into a more desired strategic mixture aimed at gaining and maintaining a competitive advantage in turbulent environments.

ACKNOWLEDGMENTS

The first author is grateful for the opportunities offered by Novartis to conduct the case studies reported here and for the helpful comments received on earlier versions of the case studies. This research has been supported by the Erasmus Research Institute of Management (ERIM) of the Erasmus University Rotterdam.

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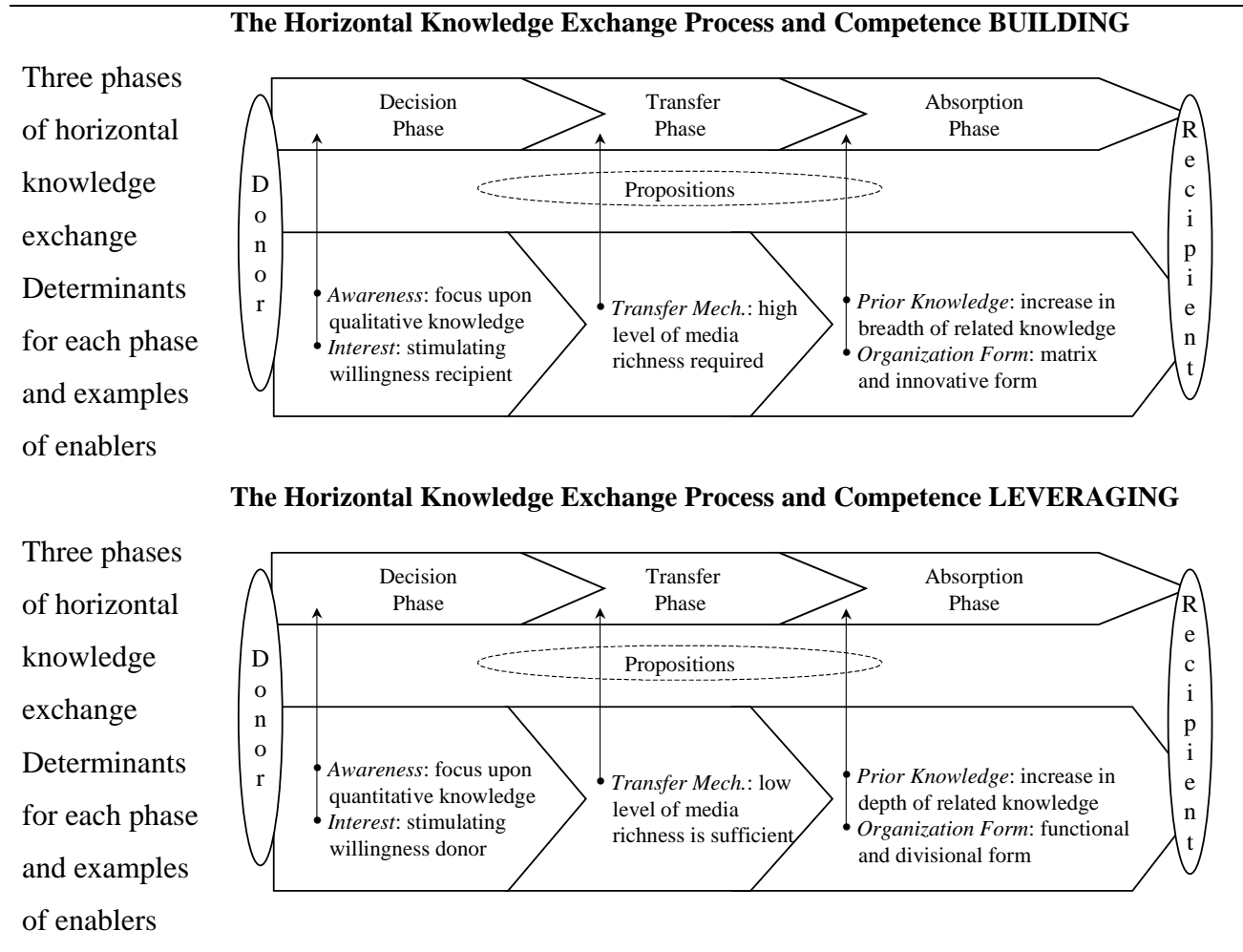
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Appendix 1- Figures

Figure 1- An Integrative Framework of Organizational and Managerial Determinants of the Horizontal Knowledge Exchange Process: Competence Building and Competence Leveraging

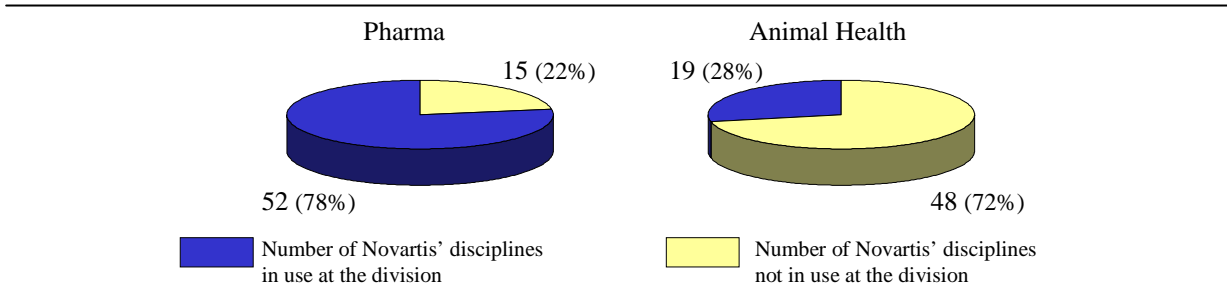


Sources: Von Krogh and Köhne (1998), Boone (1997), Szulanski (1996), Cohen and Levinthal (1990), Van den Bosch et al. (1999)

Appendix 1- Figures (continue)

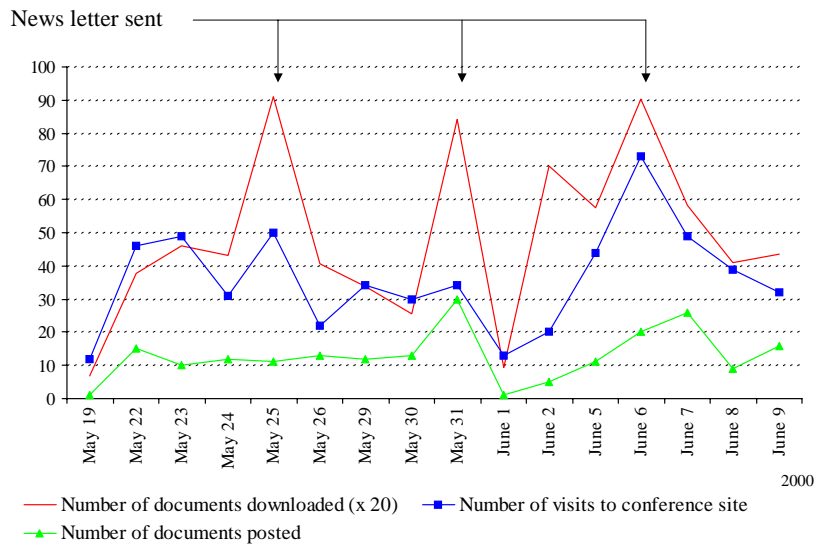
Figure 2- Tentative Visualization of Actual and Potential Breadth of Divisions' Knowledge

Base



Source: Novartis' intranet life-science network

Figure 3- Transfer of Knowledge and Impact of Newsletters During the Conference



Source: Corporate Knowledge Management Novartis

Appendix 2- Boxes

Box 1- Excerpt Interview Quotes Concerning Decision Phase of the Cross-Division

Knowledge Exchange Process

1. As a manager of the Animal Health division pointed out: *'It is difficult to know what knowledge is where. There clearly is a lack of who knows what. I think a major reason that knowledge sharing initiatives are not started is that people don't know each other across divisions; there are too less interpersonal relationships between divisions for really knowing who knows what'*. (Interview, May 2000)
2. As a manager of the Pharma division puts it: *'Knowledge is considered too much as a personal property. Scientists do not want others to look in their notebooks and are reluctant to put their knowledge into databases'*. (Interview, May 2000)
3. As a knowledge management manager of one of the divisions states: *'The most valuable knowledge for innovation is often tacit. Well, this knowledge is often difficult to understand for people who come from other areas. The problem is to make the tacit knowledge explicit in a useful manner for the recipient. For this, one has to know the processes of the donor and potential recipient very well'* (Interview June, 2000)
4. As a Development manager of one of the divisions states: *'We have to be able to run our business independently of other divisions. If we borrow too much knowledge from others, we might loose that capability'*. (Interview, June, 2000)

Source: Interviews conducted at Novartis, May-June 2000

Box 2- Excerpt Interview Quotes Concerning Transfer Phase of the Cross-Division

Knowledge Exchange Process

1. A manager of Pharma for instance comments: *'The Research and Technology Advisory Boards are very useful for maintaining a long-term, innovative and inter-division view because their projects are explorative and long-term focused. The most valuable of the RAB and TAB are the people from other divisions we get to know who work on related problems as we do'*. (Interview, May 2000).
2. An Animal Health manager pointed out: *'The Technology Advisory Board opened some doors for our division to other divisions. We met people who helped us solving problems we had'*. (Interview, May 2000)

Source: Interviews conducted at Novartis, May-June 2000

Appendix 2- Boxes (continue)

Box 3- Excerpt Interview Quotes Concerning Absorption Phase of the Cross-Division

Knowledge Exchange Process

1. As an interviewee of the Pharma division comments: *'When we join cross-division projects, we spend most of the time in providing other's with knowledge while we do not learn that much'*. (Interview, May, 2000)
2. As a manager of the Animal Health division states: *'Our division tries to use as much as possible knowledge from others; that is the way we have grown'*. (Interview, June, 2000)

Source: Interviews conducted at Novartis, May-June 2000

Box 4- Data of the Web-Enabled Conference

- Duration: launch May 22, end June 9 2000
- 140 participants, 33 nationalities
- 225 posted documents (comments, data, drawings, etc.)

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