

**Creation and Sharing of Knowledge in MNCs through
Centers of Excellence and Transnational Teams**

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ABSTRACT

In MNCs with an integrated network structure there are several different organisational forms and mechanisms, possible to use to support the creation and sharing of knowledge. In this article the focus is upon two different organisational forms: (1) centres of excellence, which function as hubs for creation and then sharing of specific locally developed knowledge, and (2) transnational teams, which function as units for assembling knowledge of different units for common processes of knowledge creation and then sharing. The design and use of organisational forms have to take into account the characteristics of knowledge involved and the organisational structure of the MNC, but also that knowledge is context specific. This calls for the use of different types of organisational forms at the same time in the MNCs to give leeway to knowledge creation and sharing.

INTRODUCTION

Sustained competitive advantage for the multinational corporation (MNC) rests on an ability to create and share knowledge and resources on a global basis, which also imply the capability to adapt to market differences and exploit global economies of scale and scope (Bartlett and Ghoshal, 1988, Kogut and Zander, 1992; Nohria and Ghoshal, 1997). The establishment of different types of organizational forms and mechanisms such as centers of excellence, transnational teams, information technology systems, transfer of best practice and communities of practices are means applied to support knowledge creation and sharing (cf. Birkinshaw 2001, Grant, 1996; Gupta and Govindarajan, 2000; Spender, 1994).

The two organizational forms most commonly used are the appointment centers of excellence on the basis of them having knowledge and resources that are of strategic importance to the rest of the corporation (Bartlett and Ghoshal, 1989; Malnight, 1996; Holm and Pedersen, 2001) and transnational teams which are designed around key knowledge creation processes (Gupta and Govindarajan, 2001; Schweiger, 1998; Ghoshal, Korine and Szulanski, 1994). The common basis for these organizational forms is that they aim at using and making knowledge available on a global basis within the MNC even if knowledge creation and sharing differ in certain aspects between them.

Knowledge creation in a center of excellence is local, that is, the knowledge is initially created at a subsidiary to meet the needs on a local market and then by designating that subsidiary a specialized role as a center of excellence to ensure that the knowledge is shared globally (Birkinshaw, 2001). A transnational team is instead an organizational constellation composed to support the creation of global knowledge through the assignment of individuals with specialized knowledge from MNC units to participate in a common global knowledge creation process (Marmer Solomon, 1998; Benson-Armer and Hsieh, 1997). The knowledge is then shared and adapted to local market conditions.

Insert Figure 1

Not many papers have so far discussed the characteristics of knowledge creation and sharing in different organizational forms in an MNC setting, even if it has been shown that a corporation's enduring source of advantage is its knowledge and that knowledge creation and sharing can be supported by the use of these organizational forms. In this paper we argue that when designing and using centers of excellence and transnational teams there is a need to take into account, the organizational configuration and the knowledge base of the MNC as a whole as well as of the two organizational forms. This calls for the use of different types of organizational forms at the same time in the MNC.

The paper begins with a discussion on the MNC context, which is followed by a presentation of the two organizational forms, center of excellence and transnational team. Thereafter the foundations of knowledge creation and sharing in the MNC are portrayed. The last section of the paper discusses the implications of knowledge creation and sharing in the MNC when using centers of excellence and transnational teams. The Swiss-Swedish multinational corporation ABB is used for illustrative purposes throughout the paper.

THE MULTINATIONAL CORPORATION

The MNC is conceptualized as an organization made up of geographically dispersed units, engaged in various activities necessary for meeting different market demands (cf. Gupta and Govindarajan, 1991, 1994; Ghoshal and Bartlett, 1990). To cope with the challenges of concurrently taking advantage of global opportunities whilst remaining responsive to local differences the MNCs are adopting an integrated network-based structure (Bartlett and Ghoshal, 1989, 1993; Nohria and Ghoshal, 1997). Coordination of global resources and

knowledge is essential for successful MNC strategy as it allows for creation and sharing of knowledge across the network of interdependent MNC units. Knowledge creation and sharing across MNC units has even been claimed to be the ultimate source of competitive advantage for MNCs as it has the greatest ability to serve as a source of sustainable differentiation compared to other corporations (Grant, 1996; Madhok and Phene, 2001; Spender, 1996). Accordingly, the MNC corporate advantage is argued to rest upon two levels: headquarters and subsidiary.

Given the heterogeneity of countries, every MNC unit has to create some degree of unique knowledge to exploit market opportunities of the local environment. This leads the subsidiaries to a gradual creation of knowledge that is different from knowledge located elsewhere in the MNC. Of course, not all that is locally created is relevant outside the local market context, but to share the knowledge that may be relevant across multiple countries has become one of or perhaps even the only competitive concern for many organizations (Birkinshaw, 2001; Grant, 1996; Szulanski, 1996). The exploitation of the location-specific advantage is secured through exploiting differences among countries, whereas the global competitive advantage mainly rests upon the MNC ability to tap into the location-bound knowledge and make it non-location-bound, and thus available to the rest of the corporation (cf. Bartlett, Doz and Hedlund, 1990; Ghoshal, 1987; Madhok and Phene, 2001).

In turn, this particular ability places great demands on adopting organizational forms that support these purposes. For example Gupta and Govindarajan (2001) claim that corporations have to excel at developing and maintaining smooth and seamless coordination across units through setting up high-levering organizational forms and mechanisms that put the desired cooperation in practice for exploiting the full potential of the dispersed knowledge within the MNC. Consequently, we believe that an essential objective of the MNC becomes to design and use different organizational forms within the overall organizational structure that allows

for a global exploitation of knowledge (Grant, 1996). In this article it is argued that two organizational forms of different character may fulfil this purpose: (1) centers of excellence, which function as hubs for creation and sharing of specific locally developed knowledge, and (2) transnational teams, which function as units in which the specialist knowledge of individuals is integrated and used for common global knowledge creation and sharing.

The Swiss-Swedish MNC ABB is known among academics and practitioners for having succeeded in adopting an organizational structure that allows for taking advantage of global similarities and local differences (e.g. Bartlett and Ghoshal, 1993; Taylor, 1991). Since the 1980's, ABB has been guided by the principle of avoiding duplications of production and product development combined with the objective of meeting local market demands, whilst taking advantage of global economies of scale and scope. The corporation uses centers of excellence and transnational teams to support these intentions. The use of these two organizational forms is argued as giving a formal recognition to the need to exploit knowledge, indifferently of its location, in the MNC. This implies that the centers of excellence and transnational teams share the overall objective of knowledge exploitation, but it is acknowledged that their inborn configuration and composition make them appropriate for different knowledge creation and sharing processes.

Centers of Excellence

In the MNC knowledge of unique country conditions typically lies dispersed in some of the corporation's subsidiaries and the capability to take advantage of this knowledge fundamentally depends on how proficient the MNC is to develop and deploy that knowledge on a world-wide basis. This does nevertheless imply that the subsidiaries first must learn from the experiences they make from activities undertaken in their markets as they encounter different demand from local counterparts to create new knowledge that are different from

elsewhere in the MNC (cf. Birkinshaw and Hood 1998; Holm and Pedersen 2001). Different subsidiaries may, therefore, develop to become of more or less importance to other units and as a result receive a role in the corporation that is determined by their contribution, or their absence of contribution to knowledge and resources to other units. Each subsidiary in the MNC's internal network can then uphold an unambiguous and well-defined role according to what they may contribute with on a global basis independently whether it rests upon them being located in a strategic important local market network (Bartlett and Ghoshal, 1986, 1989), in a geographically innovative region (Porter, 1986) or have an entrepreneurial driven management (Birkinshaw, 1997). In the view of this potential the MNC necessarily has to ensure certain resource commitments required for making the knowledge creation possible and for continuous efforts in sharing the knowledge in cooperation with other MNC units (Forsgren, Johanson and Sharma, 2001; Gupta and Govindarajan, 2000)

Centers of excellence have emerged as an organizational innovation to bring greater focus on the importance of tapping into particular subsidiaries' knowledge bases and harness the knowledge for a worldwide learning (Birkinshaw and Moore, 1998). The prerequisite for being appointed centers of excellence for certain activities and formally assigned the responsibility to make local knowledge accessible to other units is based on having a specialized knowledge that is considered to be of considerable importance to other MNC units (cf. Forsgren et al., 2001). But for the knowledge to be exploited on a global basis it requires that the other corporate units are prepared to use this knowledge that originally was created for one particular market in their activities. Subsequently, if full global earnings are to be obtained location-bound knowledge has to be transformed into non-location bound knowledge (Rugman and Verbeke, 1992; 2001).

In ABB as in many other MNCs the appointment of centers of excellence serves as a mean to manage and coordinate development activities within business areas. The establishment of

ABB Generation as a center of excellence may act as a good example of the rise of center of excellence units within ABB. The role as a center of excellence is assigned ABB Generation for hydropower control equipment. The unit is appointed as it has a knowledge advantage of product- and business related processes within this particular area relative to other subsidiaries. The creation of this knowledge can be explained by the existence of demanding home market customers and close collaboration with these customers as well as with suppliers. The subsidiary took an early initiative, compared to competitors and corporate counterparts, of setting up their own development department. It resulted not only in giving the product-related knowledge a structure, but also knowledge of managing development activities. Inherent in being a center of excellence is the responsibility of making the knowledge available to other subsidiary units and to make it possible for them to exploit the knowledge in their local markets. This implies that the knowledge developed for the center of excellence units' home market have to be made non-location bound for other subsidiaries to use it, and for that purpose practices are set up, supporting other units in adapting and integrating the new knowledge in their business activities. Employees from the center of excellence unit are appointed to conduct necessary technical and business training at the receiving units within ABB.

Transnational Teams

The transnational team is as a cross-border team composed of individuals of different nationalities, working in different cultures, units and functions possessing specialized knowledge necessary for solving a common global task in the MNC which demands the utilization of these individuals knowledge (Gupta and Govindarjan, 2001; McDonough and Cedrone, 2000; Schweiger, 1998). It is an organizational form founded upon the basic principle of assembling knowledge and resources located at corporate units worldwide in a

single temporary unit. Transnational teams are employed for different strategic tasks such as marketing, organizational change, and research and development (Bartlett and Ghoshal, 1989). Important to notice is that even if the team is distinctly demarcated in time and space from any specific MNC unit it is dependent on several MNC units for obtaining individuals and resources necessary for working on the task at hand (Partington, 1996). Continuous interaction between the transnational team and the corporate units is also required, as the solution has to be adapted to the diverse demands of local MNC units.

The composition of the team is critical, as the global knowledge development is dependent on good cooperation between the individuals to ensure creation and sharing of knowledge, which can be difficult to attain due cultural and language barriers as well as divergent backgrounds and values of the actors (Snell, Snow, Davison and Hambrick, 1998). Furthermore, on the return to their corporate units the individuals within the team have to make sure that their newly won knowledge is used in their unit, which most likely demands adaptation of the common global knowledge to the specific local market conditions.

Except from that the transnational team function as a means of solving certain tasks, it can also be considered as an important organizational form through which MNCs can accomplish increased coordination and cooperation among the corporate units (Snow, Snell, Davison and Hambrick, 1996). Cooperation in different kinds of group constellations, like transnational team, is claimed to influence and ease the sharing of knowledge within corporations. This is because cooperation in teams gives rise to a common technical and organizational knowledge base, as well as a promotion of relationships between individual actors within the MNC (Martinez and Jarillo, 1989; 1991; Schweiger, 1998; Subramaniam and Venkatraman, 2001).

One of the purposes of using transnational teams in ABB is to achieve organizational changes that are of strategic importance for the whole corporation, as the implementation of the environmental management system, which is used as an illustration here. The

transnational team is organized on three levels and consists of Corporate Staff - Environmental Affairs and networks of members at country and subsidiary level. The team members at the corporate unit are appointed from headquarters and they are chosen because of their extensive knowledge of environmental issues in general and of the environmental management system. The team members at country level are mainly appointed for being good at coordinating work processes. For team members at subsidiary level it is far more important to possess knowledge of environmental and other business systems. The main reason for creating the transnational team is the large differences in the knowledge among team members in different countries and at subsidiaries concerning environmental issues in general and the system in particular. The decentralized structure of ABB had namely resulted in some subsidiaries not taking part in the rapidly developing environmental area thus lacking knowledge in this area. Other subsidiaries that focused on environmental issues are now in possession of knowledge that is of importance for the corporation and therefore this knowledge has to be made accessible on a global basis. Except from sharing the existing knowledge among members, new knowledge necessary for handling the implementation and meeting the demands of the environmental system are created jointly in the team. Thus, quite often adaptations in the knowledge created and shared within the transnational team are made due to local market differences dependent upon for example customers' demands and country specific legislation.

Accordingly, important dimensions of knowledge creation and sharing when using centers of excellence and transnational teams are: (1) the role of structure and practices, i.e. organizational configuration of the two organizational forms, (2) the importance of absorptive capacity and communication patterns, i.e., knowledge base.

KNOWLEDGE CREATION AND SHARING IN MNCs

The competitive advantage of the corporations is claimed to rest upon the ability to harness knowledge from sources in multiple countries in order to create new knowledge, which in turn has to be shared on a global basis (Riesenberger, 1998). Important to consider when an MNC designs and uses center of excellence and transnational teams is how they align with knowledge creation and knowledge sharing. This as the possibilities to share knowledge in an organization requires an understanding of how the knowledge is created (Penrose, 1980; Grant, 1996; Spender, 1994, 1996).

Insert Figure 2

In figure 2, the factors identified as affecting knowledge creation and sharing by the means of centers of excellence and transnational teams are presented. Organizational configuration and knowledge base are claimed as the key factors. They are in turn split into two sub-factors; the former into structure and practices, and the latter into absorptive capacity and communication. In the following section the assumptions are outlined for choosing these factors.

Knowledge creation and sharing is affected by knowledge being more or less explicit, i.e. to various degrees possible to articulate and put into prints (Nonaka, 1991, 1994; Penrose, 1980). Knowledge that is less explicit and dependent on individual actors is often referred to as tacit knowledge. Tacit knowledge is acquired through practices and only revealed through its application. Spender (1994) argues that explicit knowledge at organizational level is being diffused throughout the organization through rules and guidelines. Tacit knowledge at organizational level is further argued as being embedded in the organization's institutionalized collective practices, functioning as a common understanding of how to

interact. In this paper we refer to tacitness of knowledge as knowledge being context specific in order to acknowledge that knowledge creation are both local and global in the MNC.

Knowledge creation rests upon actors performing activities in which their existing knowledge is combined and used for exploring new possibilities concerning an organization's resources. It is a matter of organizational learning and it involves an incremental process of adaptation to prevailing conditions and activities. Organizational knowledge is contingent upon the possibility to institutionalize individual knowledge into common practices to make it available to other organizational actors. Organizational practices, often also referred to as organizational routines (cf. Cyert and March, 1963; Nelson and Winter, 1984; Levitt and March, 1988) are argued to serve as repositories of organizational knowledge (Kostova, 1999; Selznick, 1957; Szulanski, 1996; Zucker, 1991). Important to acknowledge is that knowledge creation is not only affected by internally created knowledge, but also by knowledge of external sources in the environment (Argote, 1999). Knowledge creation at MNC units thus differs, as they are involved in their own sets of market networks (cf. Penrose 1980). It has implications as it differentiates the knowledge base of the different units in an MNC. Locally developed knowledge can be useful in the activities of other units, thus being the incentives for knowledge sharing. Knowledge is to various degree context specific and the more context specific it is, the more difficult it is to share the knowledge on a global basis in the MNC. Having common practices in the organization serve as means of ensuring a common knowledge base. In turn, the common knowledge base smoothens interaction between organizational actors and knowledge creation and sharing in the organization. The inherent difficulty of communicating and codifying the context specific knowledge poses significant barriers to share this knowledge in the MNC, but at the same time that also makes it difficult for competitors to replicate it.

Organizational structures and practices

The organizational structure on an overall level is important for how organizations process knowledge because the actors of the organization interact not only as individuals, but also as actors performing organizational roles (Walsh and Ungson, 1991). In an intra-organizational perspective, the configuration of the organization *per se* in terms of the degree of formalization, the extent of centralization of decision-making and the use of control mechanisms govern the possibilities to interact across units and departments (Roth, Schweiger and Morrison, 1991). Kogut and Zander (1992) and Zander and Kogut (1995), stress the importance of having compatible organizing principles among sending and receiving units as they argue that compatibility affects if and how new knowledge developed in one unit can be used in another. It is thus not only a question of whether the knowledge can be shared and used in various units within the MNC, but whether there exist a shared premises of where the valuable knowledge resides.

Common organizational practices support knowledge creation and sharing by being common codes of conduct. Szulanski (1996) discusses organizational practices as the routine use of organizational knowledge whereas Nonaka (1991) discusses the use of organizational practices as ways of making tacit knowledge explicit in order to fully exploit knowledge in the organization. Although differences exist concerning the definite meaning of the concept common practices, there is however consent about that organizational practices evolve slowly over time in an incremental manner and are well rooted in the organization. In the MNC the use of rules, procedures and practices are important as they serve as the basic fabric characterizing knowledge (Argote, 1999). The view of organizational practices adopted here is that they can be more or less conscious for the actors of the organization, but they are the set of practices – formal and informal – that support performance and govern activities.

As has been argued, the organizational structure sets the premises for an MNC in taking advantage of and exploiting knowledge and resources located at the geographically dispersed units (e.g. Levitt and March, 1988; Walsh and Ungson, 1991). In centers of excellence the initial knowledge creation process is local, that is, knowledge is created for a given context, as the subsidiary develops knowledge to respond to demands from local counterparts in their market. The knowledge creation takes place within a given formal organizational structure with well-established practices and common codes of conduct that supports the creation process. Another important aspect is the actors' prior experience of each other as a result of them working together in the same unit. Besides from being familiar with each other's knowledge they also share a common base in the institutionalized organizational knowledge within their particular unit. The role as a center of excellence unit does thus demand that the knowledge created in the unit is shared with other units, which implies that the context specific location-bound knowledge has to be made non-location bound for it be used on a global basis in the MNC. This process is of course complex, but in the ABB Generation example common formal practices, such as division of roles and responsibilities regulating what different units in the same business area are allowed to do are developed to support the knowledge sharing. Financial issues, such as funding of joint development and of joint business development activities in relation to the knowledge being shared are also regulated in formal agreements. A related aspect of importance in this case is that the knowledge is shared among units belonging to the same business area and therefore a common understanding prevails of the activities in which this new knowledge is to be used.

Knowledge creation in transnational teams is most often non-location bound and can therefore be described as global. The establishment of transnational teams reflects the MNCs concurrent emphasis on similarities and differences among countries as the team objective often is to create knowledge necessary for developing products, processes or services for

multiple markets that contains features that are standardized across markets and features that are responsive to local market demands. The means to achieve this is to appoint team members with specialized knowledge from different MNC units to take part in the creation process. Except from the mere contributing of the knowledge necessary for solving the objective, the members are bearers of knowledge of the tacit differences among country markets. To incorporate this tacit knowledge in the knowledge creation process is of considerable importance if common global knowledge is going to be possible to create. But as is indicated in the environmental management system project at ABB local adaptations are commonly necessary to make during the knowledge sharing process dependent upon country specific circumstances that can not be fully met in the creation process due to too diverse demands. An important aspect to acknowledge in relation to the knowledge creation in transnational teams is the lack of a traditional given basis in the overall MNC structure and of organizational practices. Of course, a formal structure similar to that of project organizations is often created in transnational teams once they are officially established, but quite seldom this structure allows for a permanent co-location of the geographically dispersed members, i.e., the structure is of a more virtual character. Transnational teams are also set up in the present and as a result of that lack a formal history from which organizational practices can emanate. An important implication of this is that there is a need to rely upon the utilization of different tools and mechanisms to exchange information, but as one important part of knowledge creation in transnational teams is to exploit the tacit knowledge of the team members, it becomes of considerable importance to establish a foundation for social interaction. The foundation of a basis for socialization of members within the transnational team at ABB plays a significance role during knowledge creation, but also for knowledge sharing. Meetings and education courses for newly appointed members are for example held at local units with representatives who have considerable experience of the environmental

management systems and who are part of the team from the outset. Common is also to arrange meetings to which all the team members are invited from all three organizational levels. However, when the knowledge developed within a transnational team is to be shared and integrated at local MNC units the prevailing organizational practices existing in these units fulfill an important role, as the team members are bearers of the new knowledge upon their return to their home unit. They are also familiar with the practices and common codes of conducts existing in their units, and therefore they can rely upon them during this process.

Knowledge base

The existing knowledge base of the different MNC units determines the absorptive capacity, which is the ability of the corporation to recognize new information, assimilate it and apply it to commercial ends (Cohen and Levinthal, 1990). Other MNC units may recognize novel knowledge created in a team or a subsidiary as useful, but differences in their knowledge bases may result in difficulties in assimilating and applying the knowledge to commercial ends. This is referred to as the relative absorptive capacity, which acknowledges the differences in the knowledge bases of the two parties involved in the knowledge utilization process (Lane and Lubatkin, 1998). This capacity is ameliorated through processes of social networking (Cohen and Levinthal, 1990) in terms of for example knowledge of who knows what and who can help with what problem, which in turn strengthens the ability to absorb and apply new knowledge.

Communication is an important pre-requisite for the development of absorptive capacity. The required language skill for knowledge creation and sharing is one component of the knowledge bases of organizational actors. Differences in language emerge not only from national differences, but also differences in professions. The differences causing communication gaps may be defeated by using a common corporate language, at least for

those caused by national differences (Gupta and Govindarajan, 2000). The adoption of a corporate language portrays a conscious effort to facilitate information flows between MNC units e.g. facilitate formal reporting systems, informal communication and as well as foster a sense of belonging to a global family. Competence in the common corporate language is clearly critical for effective knowledge creation and sharing within a multinational setting (Marschan, Welch and Welch, 1996). The setting up and the operation of both centers of excellence and transnational teams are contingent upon the question of language, as they rely on the communication patterns between the actors and not the least on how actors from different MNC units are perceived. Other factors important to consider are how to carry out performance appraisal and training. Language difficulties may function as a barrier due to cultural differences, interpretations of written documents, and technical and non-technical exchange. Utilization of knowledge involves two parties; a sender and a receiver, and transferring tacit knowledge, implies interaction by the sharing of experiences.

In ABB as in other geographically dispersed corporations the corporate language employed is English and this facilitates communication for example when conducting joint development activities. However, proficiency in local languages other than English often serves as a gate-opener when cooperating across units. Experiences from working internationally also smoothens the running of joint programs, as it increases the awareness of other business and social cultures.

ABB Generation, serving as a center of excellence, has a solid knowledge base of development activities in hydropower control equipment as well as the thereto-related business and management knowledge. Long lasting business relationships with local market counterparts served as important inputs in developing this knowledge. The knowledge creation is thus concentrated to one specific unit implying that the employees involved in the process do not have to face the challenges streaming from differences in language and

cultural bases. These barriers, as well as geographical distance are however something the unit has to handle when the knowledge is to be made available to other units in the business area. One mean used to handle the differences in the knowledge bases is to appoint people from the center of excellence unit to conduct business and technical training at the receiving units to make it possible for them to earn the full potential of the new knowledge. Proficiency in the corporate language and skills in local languages among employees conducting the training has turned out to be important during the knowledge sharing process, as it is a way to gain legitimacy and access to the local business operations of the receiving units. It is important not to forget the significant role the units' common technical knowledge in hydropower plays for successful knowledge sharing. Even if the initial knowledge sharing is afflicted by some major barriers the advantages of a common platform for technology and business development necessary for future cooperation concerning development activities is perceived to be so beneficial that they are worth overcoming. The common platform is a mean to avoid duplication of activities within the business area.

One of the main reasons for the use of transnational teams in MNCs is that they make it possible to access and exploit the knowledge possessed by actors located at the geographically dispersed MNC units. Individuals possessing relevant knowledge for solving the team objective are recruited to take part in the team, implying that they share a common technical base. But the members do not only bring with them a technical understanding, but also knowledge of nuances, cultural aspects and preferences, that is, knowledge concerning local differences that often is tacit. Even if such differences are of considerable importance for creating the new global knowledge they are likely to cause problems at least initially when team members are to share their knowledge with other members in order to develop novel knowledge and naturally when the team members are to agree upon a common platform for the team objective. The cultural differences can to some degree be defeated

through the establishment of common norms and behaviors in the team and of course by continuous interaction between team members, while the language differences often can be handled by using the common corporate language. In the transnational team within ABB efforts are made to handle these barriers through using an international standard which allows for country specific adaptations, but also by establishing a common corporate goal, reporting systems and documentation as well as using the corporate language which every employee within ABB is to have a good command of. The cultural and geographical differences does however not cause any major problems, but contrary to what was expected the lack of proficiency in English do as the courses and training programs are in English as well as all documentation. This result in that not all team members can participate, that manuals and other written documentation has to be translated and that contacts and communication among team members in different countries sometimes has to be channeled through English speaking persons. For obvious reasons this complicated the knowledge creation considerably. On the other hand the knowledge sharing is easier to master as the members on their return to their units can share their knowledge in their native language, and they are not either exposed to cultural and geographical barriers. It is also reasonable to assume that the global knowledge developed in transnational teams is more readily accepted at the local units as the end result is planned to contain features that are standardized across markets, but that also contain individual market features. The end result also allows for local market adaptations and these are presumably rather easily managed as team members have insights in the knowledge creation and are familiar with home market demands.

DISCUSSION

The choice of centers of excellence or transnational teams for enhancing common global knowledge utilization in the MNC not only determines whether local or global knowledge is

created, but also the future collective knowledge base of the MNC. This as the design of the organizational forms determines the possible interaction patterns between both individual actors and MNC units. In the case of centers of excellence, the actual knowledge is viewed as contingent upon the organizational unit in contrast to transnational teams in which the individual actors are accentuated as bearers of knowledge. In Figure 3 the important factors influencing knowledge creation and sharing by using centers of excellence and transnational teams are illustrated: (1) the role of structure and practices, i.e., organizational configuration, and (2) the importance of absorptive capacity and communication patterns i.e., knowledge base.

Insert Figure 3

A center of excellence has a permanent organizational structure with organizational practices that have evolved over time. The initial knowledge creation is local as the unit develops knowledge in response to demands from counterparts in its local market; the knowledge is rooted in its context of origin. The creation of the knowledge takes place and is supported by a given formal organizational structure wherein the individual actors have prior experiences of working together. There also exist common practices and routines and a shared knowledge base, in terms of similarities in absorptive capacity and the use of native language, which ease and support cooperation during knowledge creation.

Being a center of excellence demands that the knowledge created in the unit is shared with other units, which implies that the context specific location-bound knowledge has to be transformed into non-location bound for it be used on a global basis in the MNC. Sharing of knowledge from a center of excellence to other units relies on by both units having specified organizational structures within the overall MNC context and common global practices. The

sharing process is thus often hampered by the context specificity of the knowledge, differences in language skills when it comes to the corporate language and the ability to assimilate knowledge and put it into use, as there are differences in prior knowledge. Therefore, it becomes necessary to make adaptations of the knowledge to the prevailing conditions of the receiving units, which in turn requires a common understanding between the organizational actors of the means and ends of the knowledge use. Consequently, even if the center of excellence unit is the prime driver of novel knowledge creation, there is a necessity that the center of excellence and the receiving unit share some similar knowledge bases that are formed by making use of the same technology and prior experiences. To have cooperated before or sharing similar cultural understanding facilitate knowledge sharing.

In a transnational team knowledge creation is non-location bound and can therefore be described as global. The knowledge is created for a simultaneous use at multiple markets, but allowing for local adaptations. Individual actors with specialized knowledge and with their origin in different MNC units are appointed to the team to take part in the knowledge creation process. The knowledge creation in this organizational structure therefore becomes contingent upon the selection of individual actors with the right complementary knowledge necessary for solving the task at hand, which often leads to participant having different backgrounds and experiences. The diversity of the different team members' knowledge bases give leeway for innovative knowledge, but at the same time there is a lack of a formal given basis of structures and practices that can support knowledge creation. This is due to that a transnational team a temporary organizational structure set up in the present with no history from which common practices can emanate. The team members therefore have to agree upon common norms of acting and communicating to overcome the functional, cultural and language barriers.

The knowledge sharing from the transnational team to the MNC units does however have clear advantages compared to centers of excellence as the team members upon their return to their units can share the new knowledge, that is, they serve as bearers of the knowledge. The knowledge sharing is, of course, facilitated by them being able to communicate the knowledge in their native language and being familiar with the prevailing practice. The actors also have insight in the prior experiences of their home unit, which is of immense importance for the unit to be able to use the knowledge in their activities, i.e., it determines the units absorptive capacity. The acceptance and willingness of MNC units to use knowledge created in the transnational team is also higher if the team encompasses actors from the units.

To sum up, centers of excellence and transnational teams can be viewed as systematic means to manage and support both knowledge creation and sharing even if they differ in terms of how knowledge is created and shared. In a center of excellence it is a question of exploitation of locally created knowledge that needs to be adapted to global conditions. In a transnational team the knowledge creation is global with the intention of being usable at many units. However, independently of the features of the knowledge from the outset the differences in the MNC units' knowledge bases demands some kind of further adaptation to the knowledge base of the receiving units whether the knowledge springs from a center of excellence or a transnational team. For realizing these adaptations interaction between actors who have been involved in the knowledge creation and actors from the receiving units is necessary. This implies further that the creation and sharing of knowledge cannot be viewed as two separate processes, but rather as an intertwined process. It is a question of knowledge use, since it is only possible to determine if the knowledge has been shared once it is being used at the receiving MNC units.

IMPLICATIONS

An important implication springing from this paper is a need for an increased understanding among management for what kind organizational form that should be supported and used for knowledge creation and sharing. In centers of excellence the knowledge is created for local use and then adapted to global conditions, that is, a differentiated knowledge that needs to be more standardized to make it useable at multiple units. In transnational teams the knowledge created is global from the beginning and then adapted to local conditions during implementation, that is, a standardized knowledge that needs to be differentiated to make it possible to exploit. This implies that it probably is wise to support the establishment of centers of excellence if there are local units with special potentials to create new knowledge or if they already possess unique knowledge. This as being formally assigned the role as a center of excellence the unit becomes responsible for making its knowledge accessible to other units. On the other hand when new knowledge needs to be created to meet specific demands that are of importance for several MNC units and knowledge located at many units are needed to do so the establishment of a transnational team probably is a better solution. However, it is likely that MNCs have to take advantage of both possible means to exploit knowledge located at the geographically dispersed MNC units, which calls for the use of both organizational forms at the same time.

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Figure 1 Conceptualizing the research issue

Knowledge process	Centers of excellence	Transnational teams
Creation	Local	Global
Sharing	Global	Local

Figure 2 Factors affecting knowledge creation and sharing

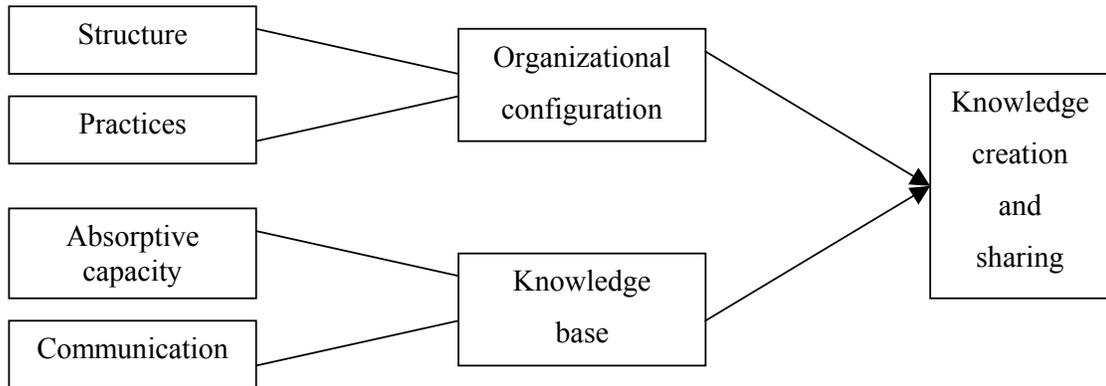


Figure 3 Factors affecting knowledge creation and sharing in centers of excellence and transnational teams

Organizational form	Organizational Configuration		Knowledge base	
CoE	Structure	Practices	Absorptive capacity	Communication
	Formal local	Trust in local	Similarities local	Native language
	Formal global	Few global	Diversity global	Corporate language
TT	Informal global	Few global	Diversity global	Corporate language
	Formal local	Trust in local	Similarities local	Native language