

**Innovation in multinational companies –
An empirical analysis of
innovation networks
between
globalisation and localisation**

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Abstract: Innovation in multinational companies is complex and involves heterogeneous actors. The importance of drawing upon globally-dispersed knowledge and entering new markets leads to globalisation of innovation activities. Simultaneously, localisation favours a close and personal interaction and thus the transfer of implicit knowledge. A redefinition of the concepts of globalisation and localisation is necessary. Then, these apparently opposite orientations can be merged into a single strategy in which they even reinforce each other. An empirical analysis of innovation in a major German multinational company illustrates the organisation of such a combined strategy.

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1. The importance of a knowledge-based perspective on innovation

Innovation is the central element upon which companies rely when establishing their competitive advantage. In the modern knowledge-based world, innovations are increasingly new combinations of existing knowledge, or they constitute newly-found knowledge that derives from the cooperation of several actors from different backgrounds (Fagerberg 2004; Teece 2000; Nonaka and Takeuchi 1995).

The combination of such diverse knowledge, no matter if across firms or within a single company, is by no means trivial (Kogut and Zander 1993: 637). The transfer of knowledge, the organisation and the coordination of different processes are thus more and more the key factors of any innovation (Gerybadze 2005: 312f.). This explains why innovations cannot take place within an isolated R&D department, but have increasingly become complex processes in which all areas of the company and many external cooperation partners take part. Such a heterogeneous cooperation requires an adequate form of coordination (Gläser et al. 2004).

In multinational companies (MNC), moreover, the knowledge comprised in one innovation project involves global expertise and aims at the world-wide market. This fact seems to lead directly to globalisation and therefore to the dispersion of the innovation activities (cf. e.g. Kuemmerle 1997). On the other hand, advantages which derive from local concentration – such as a higher degree of proximity, of homogeneity and therefore the establishment of more balanced power relations, of trust and the possibility of efficient communication – cannot be neglected either. Apparently, this creates a situation in which MNCs are continuously torn between global and local strategies. This article questions this apparent dilemma of innovation and claims that globalisation and localisation cannot only take place simultaneously, but even reinforce each other.

In order to deduct this hypothesis, I will first introduce the arena concept which will be used to characterise the interconnected nature of the innovation process. I will also address the role of a common project understanding in connecting these arenas. Then, I will continue re-defining globalisation and localisation and claim that in a knowledge-based world, especially a socio-scientific definition of these concepts cannot merely be based upon geographic facts. They rather have to be regarded as more fluent and to a high degree socially constructed concepts. Hereafter, concepts of organising innovation in an international context will be discussed and reassessed. This results in the hypothesis that globalisation and localisation are

closely linked and interdependent. A case study serves to illustrate this hypothesis. The paper concludes with a brief outlook on policy and research implications.

2. The arena concept of innovation and the importance of a common understanding

To understand the interconnected nature of the innovation process, it is helpful to think of the different functional departments that participate as arenas (Hage and Hollingsworth 2000: 976). Arenas are divisions responsible for distinct functions. Hage and Hollingsworth distinguish between six arenas: *basic* and *applied research, development, production, quality control* and *marketing* (Hage and Hollingsworth 2000: 972). These arenas can be found within an organisation, but they can also transcend organisational borders and then include external cooperation partners, experts, customers and suppliers (Hage and Hollingsworth 2000: 979). They need not even all be localised within a single country, which is why the framework is apt for an in-depth analysis of international innovation networks, especially those created by MNCs. Another important advantage of the arena concept is that it allows analysing innovation as a non-linear process that at the same time can be looked upon in a linear manner.¹

Although to a high degree these functional arenas work independently, a valuable overall result requires strong linkages between these arenas. This connectedness is crucial as it helps to coordinate the different efforts and communicate tacit and explicit knowledge (Hage and Hollingsworth 2000: 978). Furthermore, it creates a common understanding of the innovation project among all the actors.

This common understanding helps to deal with heterogeneous cooperations – and, therefore, with the inherent combination of heterogeneous knowledge – by forming a frame of reference for all the actors.² It makes them all work towards a common objective. A strong common interest binds all the heterogeneous actors to the project and thus allows contributing one's part to the project in an adequate way without consulting the others (Gläser et al. 2004: 18). Although this shared understanding differs from the different perspectives of the parties

¹ Whereas scholars generally agree that innovation is not linear, but rather includes continuous feedback-loops (cf. Kline/Rosenberg 1986) or it can be regarded as a recursive (cf. Kowol/Krohn 2000) or even a circular process (cf. Schoen et al. 2005; van de Ven et al. 1999), in the case study on hand, a linear view prevails. In the real world, this linear view helps the actors to reduce the complexity of the innovation project and to grasp in greater detail the currently and individually relevant aspects of the innovation process.

² The common understanding thus serves as what Star and Griesemer (1989) call "boundary object".

involved, at the same time it carries enough universal characteristics to create a common, transnational identity (Star/Griesemer 1989: 393). Basically, the common understanding reflects the innovation project itself, including not only its hard facts, but also the more tacit elements involved (such as trust).

I will now analyse what globalisation and localisation mean for MNCs to be then able to describe the arena-setting inherent in different organisation structures MNCs can adopt.

3. Globalisation and localisation

Globalisation does not mean dispersion

Kuemmerle (1997) describes two core reasons for internationally-dispersed innovation processes. International subsidiaries are either channels that allow companies to draw upon dispersed knowledge – so called *capacity-augmenting* subsidiaries -, or they concentrate on using existent knowledge and are therefore *capacity-exploiting* subsidiaries. In the former orientation, *explorative learning* is crucial, whereas the latter strategy concentrates more on *exploitative learning* (March 1991). Both learning advantages can be important factors in the internationalisation of R&D³ (Kuemmerle 1997: 62).

Although these factors are certainly important, globalisation cannot only be understood as such a spatial matter. It is at the same time an attitude of cognitive aperture towards the rest of the world. Thus, globalisation does not necessarily imply the dispersion of innovation activities in many different locations (cf. Heidenreich 2004: 369). It is rather about including decisive factors in the analysis independently from their origin and promoters, and in such a way linking distant localities closely enough to create interdependencies between them (cf. Giddens 1990: 64). Globalisation means incorporating a mirror image of the world's opinion in the definition of the innovation, and it carries along the air of being a global actor innovating not for oneself, but for the whole world. In short, globalisation does not mean dispersion, but the incorporation of dispersed knowledge and requirements into a single, coherent strategy.

³ R&D is, strictly speaking, only one step in the innovation process (OECD 1993: 20). Nonetheless, at the hour of looking for empirical evidence, innovation is often used synonymously with R&D. The reason lies in the difficulty of grasping the diffuse concept of “innovation” in reality.

Localisation as the creation of homogeneity

Innovations emerge from a new combination of knowledge. Therefore, the dispersed knowledge in an international setting, as discussed in the previous paragraph, presents a great advantage of international innovation. On the other hand, it forms the prime obstacle to international innovation projects: coordination as well as transfer and combination of knowledge are more difficult in such a decentralised setting (de Meyer 1993: 45; Duysters and Hagedorn 1996: 10; Granstrand et al. 1992: 7). This has two key reasons: first, the geographic distance per se and second, the heterogeneous context factors.

A greater physical distance between participating researchers complicates a close connectedness between them (Inkpen and Tsang 2005: 156). A secondary factor arises from the heterogeneous contexts into which these actors are embedded. MNCs act in various countries and therefore have to cope with different political and legal regulations as well as with diverse economic and socio-cultural factors (Birkinshaw 2000: 95; Brockhoff 1998: 22-26). Although the diverse political and legal regulations are crucial for introducing an innovation into the market, these variables are often codified and available a priori in the form of handbooks and legal publications. This is why they do not normally cause problems at a later point of time. As products can only be successful if they satisfy economic needs, it is common to undertake market research which transforms these variables at least partly into codified knowledge. This codified knowledge can again be used systematically and does not present a problem. The most problematic elements are, therefore, socio-cultural. As studies of culture show (e.g. Hofstede 1997, Trompenaars 1993), culture cannot easily be codified and always maintains a highly tacit nature.⁴

The great physical distance and the heterogeneous context in internationally-dispersed innovation projects cause three further groups of problems. They complicate the *distribution of power*, the *creation of trust* and the *communication* between the participating actors. Referring to the *distribution of power*, MNCs need to find a balance between the dispersion of power to different subsidiaries and the centralisation and control of them (Gerybadze 2005: 324f.). This dilemma is commonly called “autonomy-control tension” (Asakawa 2001: 736). *Trust* is essential for interactive learning (Lundvall et al. 2002: 219f.), but difficult to create in an international setting. It requires constant personal contact between the participating actors (de Meyer 1992: 177). Proximity contributes to a sense of trust, and, additionally, it is fostered by cultural commonalities (Cooke 2002: 84; Dupuy and Torre

⁴ For the distinction between tacit and explicit knowledge, see e.g. Polanyi (1958) or Nonaka/Takeuchi (1995).

1998: 146f.). Individuals will only be disposed to share their knowledge if they do not fear a misuse by other persons involved. Especially tacit knowledge, thus, needs direct face-to-face interaction and cannot be communicated via completely impersonal channels (Teece 2000: 13). Finally and to a high degree interdependent with the other factors, *communication* is easier in geographically proximal settings (Gassmann and von Zedtwitz 2002: 570). Even modern communication technologies cannot overcome this problem (Echeverri-Carroll and Brennan 1999: 31), although they do help to cope with periods of impersonal contact (Brockhoff 1998: 94-98). Communicating issues from one context to another is difficult, as the knowledge transferred does not only lose quality (Gassmann and von Zedtwitz 2002: 570), but can easily be misinterpreted by a person from another background (Doz et al. 2001: 134; Carlile 2004: 558f.; Lundvall 1992: 56).

Thus, localisation is important: it allows acting within a more or less homogeneous context in close proximity. This contributes to the creation of trust as well as to consensual decision-taking and to efficient communication. Furthermore, it enables the transfer of tacit knowledge which often forms the core of innovation projects.

At the same time, localisation does not signify mere spatial concentration. It means sharing a system of meanings, acting under comparable influences and towards a common goal. Localisation can very well include global actors, as long as they stay in close, personal interaction.

Table 1 presents a summary of the central characteristics of globalisation and localisation.

Table 1: Central characteristics of globalisation and localisation

	Globalisation	Localisation
Definition	Cognitive aperture	Shared system of meanings
Core advantages	Drawing upon globally dispersed knowledge; access to the global market	Proximity and heterogeneous context; creation of trust, power balance and easier communication
Communication structure	Shaped through distance	Shaped through close personal relationships
Knowledge transferred	Explicit knowledge	Tacit knowledge

Source: own representation.

Globalisation and localisation as complementary strategies

All in all, globalisation and localisation are not contradictions. *On the contrary: they are complementary. Thus, localisation can even promote globalisation.* It allows a high degree of proximity between the actors, and thus enables them to transfer heterogeneous knowledge easily from the cooperation partners to the MNC. In this way, local concentration facilitates the creation of a common knowledge base. The knowledge these actors contribute, however, derives from their global activities and thus reflects the global market and scientific state-of-the-art. Furthermore, the knowledge is locally enhanced and developed, but later used again for the whole global market. In short, knowledge is absorbed from the whole world - explorative learning - concentrated in a single location and worked upon in highly interconnected groups. This allows the MNC to optimise the results of its innovative efforts through exploitative learning. Afterwards, the outcome of the innovation project is distributed worldwide and adapted to different standards and requirements.

The next paragraph asks how this combination of globalisation and localisation can be organised.

4. The organisation of innovation between globalisation and localisation

If globalisation and localisation can be regarded as complementary strategies, the remaining issue is how this combination is reflected in the organisational structure. In accordance with the four forms of multinational companies distinguished by Bartlett and Ghoshal (1989) – *multinational companies in a narrower sense, global companies, international companies and transnational companies* – these authors also identify four types of organising innovative activities and combining knowledge. These four types mirror the extent to which companies exploit globalisation and localisation advantages. The underlying question is where knowledge is created and where it is used (Bartlett and Ghoshal 1989: 115f.). The resulting company types combined with the classification by Ambos (2002: 67-75) serve as a description of different network forms of organisation adopted in order to exploit globalisation and/or localisation strategies.

The first two company structures identified by Bartlett and Ghoshal – *local-for-local* and *centre-for-global* strategies – are not of particular interest here: they focus exclusively on one strategy (localisation or globalisation, respectively). Whereas *local-for-local*

organisations delegate all processes into their subsidiaries and thus only form a loosely connected alliance, *centre-for-global* strategies imply an ethnocentric approach. Thus, in both cases all the arenas of innovation are located in one subsidiary and the transfer of knowledge between the subsidiaries plays an inferior role (Ambos 2002: 71-74; Bartlett and Ghoshal 1989: 116-118).

Organising *locally-leveraged* or *globally-linked* innovation is more complex and, therefore, allows the combination of globalisation and localisation advantages. In the *locally-leveraged* form, competences are spread between the different subsidiaries that are regarded as *centres of competence*. Every subsidiary specialises in a certain area and acts as an expert the other subsidiaries and the headquarters consult when they need advice. All parts of the MNC learn from each other and together create the organisational knowledge base (Ambos 2002: 72; Bartlett and Ghoshal 1989: 118f.). Subsidiaries organised *globally-linked* are even more interconnected and can be considered as *integrated research entities* as they closely cooperate with the headquarters as well as with each other, even within a single project (Ambos 2002: 74f.; Bartlett and Ghoshal 1989: 119f.).

In these two latter types of organisation – *locally-leveraged* and *globally-linked* – the six arenas are not necessarily found in a single location, but can be spread over various subsidiaries or even embrace several locations. Such networks of knowledge interaction have a high potential of combining diverse knowledge from different parts of the organisation, but at the same time, they present a challenge to efficient company coordination. Here, the common project understanding is crucial in order to channel all innovation efforts towards a common aim.

Figure 1 gives an overview of these organisational forms.

Figure 1: Organisational types of international innovation

Potential for globalisation advantages	high	<i>Centre-for-global</i> <i>Global development division</i> Global company	<i>Globally-linked</i> <i>Integrated research entity</i>	Transnational company
				<i>Locally-leveraged</i> <i>Competence centre</i>
	low	National company	<i>Local-for-local</i> <i>Local adaptor</i> Multinational company	
		low	high	
		Potential for localisation advantages		

Source: own representation.

In short, organising international innovation processes which comprise different arenas and actors is complex. The internationalisation of corporate activities in general and innovation in particular has been identified as a current development in many empirical studies. Nonetheless, the concentration of activities and the creation of clusters are also significant. I claim that these developments are not contradictory. MNCs are in a position not only to identify the advantages deriving from both strategies, but also to incorporate them into a single strategy. They combine elements of globalisation and localisation via networks and have the potential of creating a transnational strategy without becoming nationally de-rooted. *My hypothesis is, therefore, that globalisation and localisation cannot only take place simultaneously. Moreover, localisation can favour and strengthen the global orientation of a MNC and vice versa.*

5. Empirical analysis of an innovation project in a MNC

In order to test this hypothesis, I have conducted qualitative, non-standardised expert interviews in an innovative German MNC active in medical technology. The four interview partners all participate in the same important innovation project of the company and are representatives of the departments of marketing, development and the project managers of two different company divisions.⁵ The idea of this design is to obtain an overall view of the innovation process, the different arenas involved and the connectedness between and within them.

The project on hand is a very large and strategically important product innovation for the company. Its target is the development of a new and highly complex device in medical technology. Whereas most of the underlying innovation processes take place in one German region, the product aims at the global market. Although almost all the activities involved are located in one region, I wish to argue that the strategy described is not ethnocentric, but a globally-oriented form of *locally-leveraged* innovation.

The underlying reasons of my argument are twofold. First, ethnocentricity always implies a certain degree of ignorance and cultural imperialism against the rest of the world – something that cannot be observed here. Second and even more important, I have already stated that the *geographic location* of the arenas – development, marketing, etc. – is not the

⁵ I interviewed a member of the project management team, the head of the marketing department, the project manager of an internal supplier and the head of R&D of that same internal supplier. All four interviews took place in January 2006.

crucial part of a definition of globalisation. What matters is the *focus* a company adopts at the hour of designing an innovation. Whose interests does the company take into account, whom does it ask about their opinion, and which knowledge does it draw upon? In the company on hand, the marketing department has a strong global focus, and it takes care of the consideration of globally-dispersed customers' interests as well as of the current level of research on various continents – again mirrored by a close interaction with the customers. The localised setting of the company then allows strong links between the globally-oriented marketing department and the other arenas. Thus, the global focus can be transferred across the functional borders and becomes a characteristic of the whole innovation project.

I will now describe in more detail how the reinforcement of globalisation and localisation is organised in the company on hand. Structuring this description, I will follow the concept used by the MNC itself, which is a stage-based, almost linear view of the innovation process comprising product portfolio management (the invention), the define phase, the realise phase and the commercialisation.

Globalisation and localisation in the course of the innovation process

Product Portfolio Management: global exploration and new ideas

The very first step towards an innovation is to grasp what kind of product is currently needed and to get a better idea of what the innovation project should be about. Thus, ideas for new products are collected and the requirements of the new product are identified and defined. This stage is crucial for capturing globally-dispersed knowledge and for incorporating all the relevant requirements and competences into a single project. In order to achieve this, a project team is set up. It incorporates representatives from all the functional arenas identified. This means that already at the very beginning, not only researchers and developers discuss the future product, but right from the start they consult managers in charge of production and marketing.

In order to capture the worldwide needs, the MNC cooperates with a closely-knit network of customers from all over the world. About 15 to 20 opinion leaders among these customers are invited to participate in a workshop. The project team of the company – led by the marketing which establishes customer contacts – only acts as the moderator, whereas all the external cooperation partners are encouraged to make suggestions and to contribute their ideas and expectations towards the development of the new product. This results in a concrete idea of what to expect from the innovation – a reflection of the globally-dispersed

requirements as well as a mirror of expertise and suggestions from all over the world. It is thus based on filtering and absorbing all the relevant knowledge, which reflects the nature of explorative learning.

As the participating customers come from diverse backgrounds, the underlying cooperation is very heterogeneous and requires a commonly-understood project target to connect the different actors. This is not easily achieved as the knowledge involved is highly implicit. The diffuse nature of the exploration phase makes it difficult to introduce any form of structuring. However, through the close and personal interaction in the workshop, a high level of trust can be formed, and face-to-face communication helps to transfer these implicit elements. The consensual decision taking process which involves all the actors helps to create a high level of identification with the project. As the whole innovation project is not yet clearly defined at this stage, the connecting understanding lies in this identification, i. e. in the shared interest of solving a common problem.⁶ At the same time, this shared understanding is the core of the innovation project itself, which illustrates how the very project serves as the link between divergent actors and interests.

Additionally, already at this early stage, diverse context factors have to be considered. As laws and regulations are written down and thus available in a highly explicit form, they do not present a big obstacle.⁷ More importantly, the marketing strategy and its communication have to be adapted to the diverse health systems which vary considerably between the different countries. Much of the relevant knowledge is implicit. This knowledge is not as easily incorporated and can only be tapped into by closely interacting with the customers who are insiders in these markets and therefore have access to such knowledge. Additionally to the knowledge and the ideas the customers contribute, this aspect underlines their importance as strategic insiders in the crucial markets.

Defining and specifying – global exploration combined with local concentration

The next step towards the innovation consists in defining what exactly can be done, how it can be achieved and who is to do what. In writing a comprehensive specification⁸, the implicit knowledge is – as far as possible – transformed into explicit knowledge, a process called

⁶ This common problem refers to the technical aspects of the innovation project. In reference to the underlying business model, the interests of the MNC may differ considerably from those of its customers.

⁷ As the innovation project at hand is a very complex medical device which is to be marketed globally, the MNC benefits from a high degree of standardisation of this product. This explains why major adaptations to the local markets are avoided where possible, which further reduces the importance of the context factors.

“externalisation” (Nonaka and Takeuchi 1995: 64). Here, technical know-how from all parts of the world is necessary. The cooperation, this time, is concentrated on the suppliers; especially on those who take an active part and develop critical components of the new product. In a very dense and concentrated phase, the project team and core suppliers work together intensively. The most important external partners even have workplaces in the MNC. There is a two-week period to start off the process, in which drafting and sketching takes place in a single room with all the important members present full-time. Although most of the suppliers have a subsidiary in close proximity to the MNC, they themselves are usually global players who can draw on expertise enhanced through international cooperations and global sub-suppliers. Through this face-to-face interaction between global actors, again the global state-of-the-art can be reflected in the outcome, although most of this process takes place in a single location. Furthermore, here, too, decisions are predominantly taken in a consensual manner, which guarantees a higher commitment of all the participants.

The result of this process is the specification. This document is an attempt of making the boundary object more concrete and thus an even more powerful tool in two ways. First, the detailed description allows the participants to contribute their part to the project to a certain degree independently from what the others do. It therefore paves the way for a looser cooperation in the development stage. At the same time, the closely interconnected work when writing the specification contributes to a sense of trust and a common understanding of the project. This less deliberate and more tacit way of shaping the common project understanding is very important, as one interviewee illustrates:

„In the end, there is always a level where individuals have to take important decisions which cannot be specified. Therefore, everybody needs a basic understanding of how the small thing he is doing affects the customer afterwards, worst case or best case. This is how he has to take the decision about how to do it.” (marketing manager)

Once created, this trust does not cease to exist at the end of this stage, but can be transferred to other stages in which it helps to maintain a close interaction without the need of frequent face-to-face contact.

Realise Phase – local exploitation

Although the development process takes place in subdivided groups that occupy themselves with their component only, *within* each of these groups, close interaction is crucial. Even

⁸ A specification is a written – and therefore explicit – document which includes information on technological, physical and market requirements the product has to meet. It is usually very detailed and serves as the basis for

though there are several arenas involved, the borders between them are blurred through working in the same office or at least in the same building together. Cooperation between the different groups – i.e. within the arenas – is maintained via weekly project team meetings in which representatives from all the groups participate and the progress of the project is discussed. This close interaction helps to take decisions in a consensual manner.

„[Decisions are taken] by a management circle, called „process owner“. All the processes participate in it: development, marketing, logistics, manufacturing, production, cost controlling, and the manager of our line of business.“

(marketing manager)

Although the clients do not play an important role in this phase, the contact has to be maintained. This is partly the task of the marketing department in the innovating subsidiary itself. Its employees visit the clients approximately twice a year. At the same time, direct and personal contact is needed. Therefore, the globally-spread subsidiaries of the MNC take a mediating role and establish and foster a close and trust-based relationship with the clients localised in their region.

The realise phase continues with the construction of the first prototype, which requires merging the different parts of the new product into a whole. Here, interaction again becomes crucial, and maximum efficiency is achieved through the local concentration of all participating actors as this allows tapping the full potential of the accumulated knowledge. Most cooperation partners put their components into operation themselves, and the proximity allows them to help out rapidly when problems occur. Many mistakes can be more quickly and more easily identified when the expert is physically present. This effect derives from the implicit knowledge that is necessary to detect unexpected problems. As there are many components interacting, it is helpful to have the actors involved interact in a similar fashion. This helps to exploit the disposable knowledge, as especially implicit components would get lost in distant communication. This is illustrated by the following quote.

„I feel it is extremely useful that the producers of key components, which are technically sophisticated parts, are located in close proximity. And that it is thus possible to get into touch quickly, and to solve problems together vis-à-vis. A video conference might be quite nice, but it covers maybe 70 or 80 percent. However, the remaining 20 percent are crucial, and that is why I must not rely on video conferences. I have to fly there, or I drive [to the close subsidiary], and this is very advantageous.“

(R&D manager)

In the next stage, the test of the prototype, the clients re-enter the innovation process. They are considered the experts who know exactly what is right and what should be changed. In the innovation project at hand, several prototype devices were established; some of them in proximate university hospitals, others in renowned and representative hospitals in key market areas worldwide. This two-fold approach permits taking advantage of two aspects at once: the locally-installed prototypes allow a very close observance and a daily-based exchange between the project team and its customers.

„We have a test stage before products first enter the market. [...] The product is then installed at the customers to be tested, and it is a clear development priority that [our] developers take part in this. They observe how the customer uses the device and if there are any errors, [the developers] communicate them to the development department in order to have them corrected. [...] This is when the developer needs to establish personal face-to-face contact with the customers.” (marketing manager)

Complementary, the globally-dispersed customers offer the opportunity of testing the prototype under different conditions. Thus, although geographic proximity carries advantages, it is supplemented by a global perspective. This can be considered as a combination of global and local strategies in a single stage of innovation.

Commercialisation – back to the global market

The customers who have participated in the definition of the product requirements are, at the end of the development process, the first ones to implement the new product. Now, the formerly-identified needs of differentiation have to be put into practice. This allows the MNC to spread its product over the whole world from the very beginning, and as the customers who first implement the new device are the ones who contributed to its definition, they are likely to promote it positively.

„It is important to maintain an active relationship to the customers when the product is launched, as they will, naturally, be the first ones to use this new technology. [...] Of course, this is also important considering strategic aspects of marketing: if you are in the position that the global opinion leaders take your side, that you cooperate closely with them and they know the new technology, this contributes decisively to a rapid diffusion of the message in the market: [name of the MNC] has built something fantastic and it is established at the world's leading institutes and it makes sense. As they have participated in the design, one can count on their support during the commercialisation of the product.” (marketing manager)

This illustrates how the aim of this strategy is a rapid dispersion of the product over the whole globe, combined with a powerful campaign of individual recommendations and promotions.

The locally-leveraged strategy: transnationalism with local roots

This detailed description of the innovation process illustrates that although the strategy followed by this MNC might seem ethnocentric at the first glance, this is a misleading interpretation. Rather than blindly concentrating all activities in one subsidiary, the company division I have analysed has managed to become an open and globally-competing centre of competence in its business. Other business departments rely upon it in its field of expertise, but on the other hand, it relies on other centres of competence itself. The strong concentration in medical technology in this region is compensated for by a spread of activities through other regions and countries in other business segments all held together by a powerful network configuration.

An interesting observation is that the global orientation is mainly achieved via the arena of marketing. Drawing upon globally dispersed knowledge as well as launching the new product in the market are the two stages in the innovation process which are predominantly globally oriented. In both, customers are the main cooperation partners, which is why the marketing establishes the crucial contact. Via a strong nexus to the other arenas, the marketing transfers this orientation to the innovation project as a whole, although many of the activities are predominantly local.

This leads to the conclusion that a second, closer glance is certainly worthwhile – and that globalisation and localisation need not be contradictory. Moreover, at least in the case on hand the hypothesis has proven to be true: it is possible to combine both strategies into a highly successful, transnational orientation – where transnational does not mean de-rooted, but rather locally rooted with a strong global orientation. In this way, concentration can complement globalisation in a very powerful way: it promotes security and a “safe zone” of innovation for the participants, it fosters the creation of trust and frequent communication, and by enabling very creative and at the same time efficient cooperation, it helps to exploit all the possibilities the knowledge – gathered from all over the world to concentrate in this region – carries along.

Moreover, the process of combining globalisation and localisation is a dynamic one. As personal interaction is so important, many of the relevant experts and suppliers establish subsidiaries in close proximity to the MNC, which gradually leads to the creation of a cluster. This cluster again reinforces both global and local strategies: it increases the possibilities of local cooperations and thus leads to an even greater concentration of activities in the region. At the same time, the emerging network between these actors gives them the strength and the

support to persist in or to enter the global market and to draw upon globally dispersed knowledge. Again, globalisation and localisation reinforce each other.

6. Policy and research implications

If innovation works in the same way as in this case study and it is sufficient to globalise one arena in order to achieve a transnational orientation – as long as this arena is closely interconnected with the other arenas – this opens up a whole range of new opportunities for MNCs. First of all, it means that it is possible to organise innovation projects within one organisation in very different manners and in concordance with their individual nature. More complex innovation projects can be localised to a high degree in order to optimise the interaction between researchers and the combination of diverse knowledge in a rapid and efficient way. On the other hand, explorative innovation projects which rely upon knowledge from various sources and depend upon diversity can be organised decentrally and with less strong bonds between the participating actors. Secondly, these strategies can change in the course of one project. At the beginning, close interaction is more important than during the actual development itself, as long as clear definitions have been developed in common meetings. In the end, individual results have to be put together, which again requires face-to-face contact.

There are at least two more implications that can be drawn from my results. One is that a re-examination of the globalisation advantages as proposed by Kuemmerle (1997) is necessary. His two forms of globalisation advantages are still important. However, they do not directly imply a global dispersion of innovative activities. On the contrary, they can just as well foster localisation: the exploitation of knowledge works better in a closely concentrated setting. At the same time, globalisation remains necessary for exploring and drawing upon all the available knowledge. This makes globalisation and localisation not only two processes which take place simultaneously, but two interdependent forces which strengthen each other. Globalisation without regionalisation leads to a mere collection of non-usable knowledge; localisation without globalisation results in a narrow-minded lock-in orientation. Together, however, they form a sustainable competitive advantage for MNCs.

The other result is that the differentiation between ethnocentric and global organisations might be too simplified and has to be reconsidered. Bartlett and Ghoshal (1989) describe companies that combine elements of multinational, global and international

organisations as transnational. This is a correct, but very general description. I suggest differentiating between various degrees of transnational companies, which could include a “strongly locally-rooted TNC” as well as a “globally-oriented TNC”. Such a more differentiated classification would better acknowledge the fact that globalisation and localisation advantages can be mended into a variety of combined strategies, and explain the degree to which MNCs adopt the two strategies. In the knowledge economy, it is more and more a necessity to find such a combined strategy, as a mere concentration on globalisation or localisation can only result in failure in the long run. In order to understand better how to organise such an all-compassing strategy, a closer look on the organisation of innovation in MNCs is indispensable.

References

- Ambos, Björn, 2002: Internationales Forschungs- und Entwicklungsmanagement. Strategische Mandate, Koordination und Erfolg ausländischer Tochtergesellschaften. Wiesbaden: Deutscher Universitäts-Verlag.
- Asakawa, Kazuhiro, 2001: Organizational tension in international R&D management: The case of Japanese firms. Pp. 735-757 in: *Research Policy*, Vol. 30.
- Bartlett, Christopher A. and Ghoshal, Sumantra, 1989: *Managing across borders. The transnational solution.* Boston: Harvard Business School Press.
- Birkinshaw, Julian, 2000: *Entrepreneurship in the global firm.* Sage Strategy Series. London/Thousand Oaks/New Delhi: Sage Publications.
- Brockhoff, Klaus, 1998: *Internationalization of research and development.* Berlin/Heidelberg: Springer.
- Carlile, Paul R., 2004: Transferring, Translating, and Transforming: An Integrative Framework for Managing Knowledge Across Boundaries. Pp. 555-568 in: *Organization Science*, Vol. 15, No. 5.
- Cooke, Philip, 2002: *Knowledge economies. Clusters, learning and cooperative advantage.* London/New York: Routledge.
- de Meyer, Arnoud, 1992: Management of international R&D operations. Pp. 163-179 in: Granstrand, Ove / Håkanson, Lars / Sjölander, Sören (eds.): *Technology management and international business. Internationalization of R&D and technology.* New York et al.: John Wiley & Sons.
- de Meyer, Arnoud, 1993: Internationalizing R&D improves a firm's technical learning. Pp. 42-49 in: *Research Technology Management*, Vol. 36, No. 4.
- Doz, Yves L. et al., 2001: *From global to metanational: How companies win in the knowledge economy.* Boston: Harvard Business School Press.
- Duysters, Geert / Hagedoorn, John, 1996: Internationalization of corporate technology through strategic partnering: An empirical investigation. Pp. 1-12 in: *Research Policy* 25.
- Echeverri-Carroll, Elsie L. / Brennan, William, 1999: Are innovation networks bounded by proximity? Pp. 29-49 in: Fischer, Manfred M. et al. (eds.): *Innovation, networks and localities.* Berlin et al.: Springer.
- Fagerberg, Jan, 2004: Innovation: A guide to the literature. Pp. 1-26 in: Fagerberg, Jan / Mowery, David / Nelson, Richard (eds.): *Handbook of innovation.* Oxford: Oxford University Press.
- Gassmann, Oliver / von Zedtwitz, Maximilian, 2002: Market versus technology drive in R&D internationalization: Four different patterns of managing research and development. Pp. 569-588 in: *Research Policy*, Vol. 31.
- Gerybadze, Alexander, 2005: *Technologie- und Innovationsmanagement in internationalen Konzernen: Organisation und Führung länderübergreifender Wissensproduktion.* Pp. 311-328 in: Brandt, Werner / Picot, Arnold (ed.): *Unternehmenserfolg im internationalen Wettbewerb: Strategie, Steuerung und Struktur.* Stuttgart: Schäffer-Poeschel.
- Giddens, Anthony, 1990: *The consequences of modernity.* Stanford: Stanford University Press.
- Gläser, Jochen / Meister, Martin / Schulz-Schaeffer, Ingo / Strübing, Jörg, 2004: Einleitung: Heterogene Kooperation. Pp. 8-24 in: Strübing, Jörg / Schulz-Schaeffer, Ingo / Meister, Martin / Gläser, Jochen (eds.): *Kooperation im Niemandsland. Neue Perspektiven auf Zusammenarbeit in Wissenschaft und Technik.* Opladen: Leske + Budrich.
- Granstrand, Ove et al., 1992: Introduction and overview. Pp. 1-18 in: Granstrand, Ove / Håkanson, Lars / Sjölander, Sören (eds.): *Technology management and international business. Internationalization of R&D and technology.* New York et al.: John Wiley & Sons.
- Hage, Jerald / Hollingsworth, Rogers, 2000: A strategy for analysis of idea innovation networks and institutions. Pp. 971-1004 in: *Organization Studies*, Vol. 21, No. 5.
- Heidenreich, Martin, 2004: Conclusion: the dilemmas of regional innovation systems. Pp. 363-389 in: Cooke, Philip / Heidenreich, Martin / Braczyk, Hans Joachim (eds.): *Regional Innovation Systems: The role for governance in a globalized world.* 2nd edition. London/New York: Routledge.
- Hofstede, Geert, 1997: *Cultures and organizations. Software of the mind.* New York et al.: McGraw-Hill.
- Inkpen, Andrew C. / Tsang, Eric W. K.: Social Capital, Networks and Knowledge Transfer. Pp. 146-165 in: *Academy of Management Review*, Vol. 30, No. 1.
- Kline, Stephen J. / Rosenberg, Nathan, 1986: An overview of innovation. Pp. 275-305 in: Landau, Ralph / Rosenberg, Nathan (eds.): *The positive sum strategy.* Washington: National Academy Press.
- Kogut, Bruce / Zander, Udo, 1993: Knowledge of the firm and the evolutionary theory of the multinational corporation. Pp. 625-645 in: *Journal of International Business Studies*, Vol. 24.
- Kuemmerle, Walter, 1997: Building effective R&D capabilities abroad. Pp. 61-70 in: *Harvard Business Review*, March/April.
- Lundvall, Bengt-Åke, 1992: User-producer relationships, national systems of innovation and

- internationalisation. Pp. 45-67 in: Lundvall, Bengt-Åke (ed.): National systems of innovation: Towards a theory of innovation and interactive learning. London: Pinter Publishers.
- Lundvall, Bengt-Åke et al., 2002: National systems of production, innovation and competence building. Pp. 213-231 in: Research Policy, Vol. 31.
- March, James G., 1991: Exploration and exploitation in organizational learning. Pp. 71-87 in: Organization Science, Vol. 2, No. 1.
- Nonaka, Ikujiro / Takeuchi, Hirotaka, 1995: The knowledge-creating company. How Japanese companies create the dynamics of innovation. New York/Oxford: Oxford University Press.
- OECD 1993: Frascati Manual. The measurement of scientific and technological activities: Proposed standard practice for surveys of research and experimental development. Paris: OECD Publishing.
- Polanyi, Michael, 1958: Personal Knowledge. Towards a post-critical philosophy. London: Routledge & Kegan.
- Schoen, Jeremy et al., 2005: The innovation cycle: A new model and case study for the invention to innovation process. Pp. 3-10 in: Engineering Management Journal, Vol. 17, No. 3.
- Star, Susan Leigh / Griesemer, James R., 1989: Institutional ecology, 'translations' and boundary objects: amateurs and professionals in Berkeley's museum of vertebrate zoology, 1907-1939. Pp. 387-420 in: Social Studies of Science.
- Teece, David J., 2000: Managing intellectual capital. Organizational, strategic, and policy dimensions. Oxford: Oxford University Press.
- Trompenaars, Fons, 1993: Riding the waves of culture. Understanding cultural diversity in business. London: Nicholas Brealey Publishing.
- van de Ven, Andrew H. et al., 1999: The innovation journey. New York: Oxford University Press.