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How Foreign Subsidiaries Develop into Integrated Competence Centres

Abstract

Foreign subsidiaries acting as “integrated competence centres” is an organizational design that improves the building of capabilities in multinational corporations. In this knowledge-creating process the headquarter uses a bottom-to-top strategy, where the initial competence-building starts in independent and autonomous subsidiaries, exploiting their internal learning processes and relations to local advanced customers and science centres. The purpose of the subsidiary is to develop basic designs of future competitive products. The headquarter assigns mandates and resources for further development of the competence so it qualifies for global sales exploitation. After gaining a mandate the subsidiary concentrates its R&D within a focused area. Central monitoring systems and corporate socialization mechanisms secure the possibility of intra-organizational integration and utilization of competences. Further, knowledge transfers within the corporation help the competence centre with its product development. A case study of two foreign-owned Danish high technology subsidiaries test the approach. Both companies build up competence in focus areas, and use intra-organisational instruments to integrate knowledge. However, they differ in their historical background and how they gain the mandate for further competence development.

1.0 Introduction

The competence approach plays an important role in the strategies of multinational corporations. The strategy is to focus very narrowly on core competences to secure a sustained competitive position in the market, Prahalad & Hamel (1990). An essential question is which future strategy will be superior for the multinational corporation in the creation and development of core competences. This paper takes its point of origin in the statement that a superior organizational structure in multinational corporations is the one with excellent foreign subsidiaries acting as developing centres of competence through integrated R&D units. The aim is to establish an individual R&D unit where internal competence development take place and at the same time brings in the best from the external scientific local environment. The result is a multinational corporation with intense technology interaction based on cross functional learning processes ending with centres of unique knowledge at different locations, Gerybadze & Reger (1998). What is rarely touched on is the initial development of those competence centres. Which mechanisms result in a specific subsidiary suddenly becoming an important knowledge centre on which other units depend. What creates the first elements of competence, and how does the headquarters, in often very large MNCs, recognize and approve basic designs of future products. The next step in the process is to distribute mandates and resources to the subsidiary to secure the necessary development into a final product design with global sales opportunities. This paper tries to illustrate the process leading to such competence centres, and how they subsequently fit in the corporation. The structure of the paper is first to discuss how the headquarter decides which subsidiaries should develop into a future competence centre. Next to discuss which role the subsidiary plays in the corporation when acting like a competence centre. This analysis takes its point of origin in the knowledge inputs, autonomy status and the R&D profile of subsidiaries. Finally, the theoretical part ends in a discussion of the main theme "the integrated competence centre." Two cases exemplify the theoretical assumptions. The two firms, Krüger and LM Ericsson Denmark, are both foreign-owned high-technological Danish subsidiaries.

2.0 The Pick-out of Future Competence-Centres

Competence creation takes place when a unit systematically and focused develops new and unique knowledge that gives a future commercial advantage over competitors. The theoretical point of origin is the resource-based view, where heterogeneous resources and administrative systems give a capability that is hard to imitate for competitors, Penrose (1959), Rumelt (1984), Wernerfelt (1984), Barney (1986). The question for the headquarter is whether it should place the future development of competence centrally or disperse this into subsidiaries. Regarding the latter, not every corporate unit can be a superior competence centre, so the headquarter has to decide which subsidiaries deserve the mandate and the necessary resources for the development of competences. One way to make this decision is to follow a bottom-to-top strategy, whereby the subsidiary takes an independent initiative in developing their existing knowledge base to a competence level and starts to collect knowledge and based on that knowledge formulate and investigate more precise ideas. The process involves three steps. An initial search for new market opportunities both in local market and within the corporation. Next the pursuit the development of appropriate capabilities to fulfil market opportunities, and finally the proposal to the parent company for a new charter. In the last step, it is important to draw the headquarters attention to the fact, that they now possess a competence that is valuable to the rest of the corporation. To gain a mandate is a question of power based on the headquarters expectation of the future value of the developed basic design, Birkinshaw & Hood (1998)

Because of size and lack of resources on the one hand and a need for making products with global sales opportunities on the other, the subsidiary needs support in form of mandates and resources from the headquarter. The subsidiary therefore, makes a proposal to the headquarter who then decides whether this could lead to a future competence area and then assigns the needed mandate and resources to the subsidiary. A mandate is those elements of business in which the subsidiary participates and for which it is recognized to have responsibility within the MNC, Galunic & Eisenhardt (1996). The effect here is that the headquarter actually changes

their goals and strategies according to the wishes of the subsidiary. This gives a link between capability and the charter, or privilege or mandate of the subsidiaries.

Other strategies exist as well. Most important is the adverse strategy, the top-to-bottom approach, where the headquarter formulates a special R&D need and different subsidiaries then compete for the assignment of the mandate. The best subsidiary qualifies through the quality of its internal R&D resources and how they fit in the overall strategy. The greatest difference is that capability development starts *after* the gaining of a mandate. The choice of the two strategies is a question of whether it is possible to improve a central determination of strategy by taking the point of origin in local customers and internal knowledge-building in the subsidiaries. In some cases subsidiaries may produce ideas that are much more radical, and therefore it is possible to widen or reformulate more sticky technological trajectories of the MNC, Pearce (1996). What is equal in the two approaches is the competition between subsidiaries to gain mandates through the proposals they make. Finally, the bottom-to-top strategy also consists of disadvantages. The development of subsidiaries is not always positive from the MNC's perspective. Changes that rise from host country laws or customer requirements may force the headquarter to go in a direction that they do not want. Further, subsidiaries may change for their own sake, irrational reasons such as empire-building do also exist, Birkinshaw and Hood (1998).

3.0 The Different Roles of a Subsidiary

The ability to develop basic designs and to gain mandates for further development of competence depends to a high degree on the role the subsidiary plays in the corporation. Does the specific unit act in strategic ways that give knowledge and influence power to build up capabilities and further gets credit for the job they are doing. A lot of literature deals with the different roles that subsidiaries can play; going from pure sales channels to highly independent R&D units, Poynter & White (1985), Bartlett & Ghoshal (1986) (1989), Roth & Morrison (1992), Gupta & Govindarajan (1994), Birkinshaw & Morrison (1995), Birkinshaw (1996), Pearce (1996), Andersson (1997), Taggart (1997) (1999), Nohria & Ghoshal (1997),

Papanastassiou & Pearce (1997), Pearce & Papanastassiou (1997), Forsgren & Pedersen (1997) and Schmid (1999). Most of these studies in a way graduate the different roles, and often the “best” subsidiary is the one, where independent product development takes place. An example is the “strategic independent unit”, defined by Poynter & White (1985) where the subsidiary has the freedom to develop lines of business for either local, multicountry or global markets. The subsidiary can, by themselves, scan the market for future opportunities and develop competences to fulfil them. The only link to the headquarter is often only administrative and financial relations.

This independent approach later theoretically develops into the terminology of the “world product mandate” design, Roth & Morrison (1992), Birkinshaw (1996). Here the subsidiaries' freedom is limited to certain specific products or lines of business. In return, the responsibilities go beyond their local markets. This role links more to the marketing side of the value chain than the R&D production *per se*. In fact, those subsidiaries might draw on R&D taking place elsewhere and purely concentrate on sales effort. These kinds of subsidiaries are therefore highly dependent on other units of the corporation, and therefore both act within the overall corporate strategy.

Recently the “centre of excellence” or “centre of competence” approach emerges in the literature. The focus is the creation of competence that takes place in certain subsidiaries. Those units have according to Gerybadze & Reger (1998), a high R&D degree, and have a strong strategic influence on their own technological trajectories.

This results in specialized units and therefore it is necessary to look for an organizational structure that reflects a higher degree of interdependency among units. Proposed here is a mix between centres of excellence, and the kind of units that take part in interorganizational network in the corporation as described by Bartlett & Ghoshal (1989) in their well-known approach of the transnational firm, and further developed in the differentiated network, Nohria & Ghoshal (1997). One role here is the local for global structure where the subsidiary takes cares of initial innovative activities and then later diffuse innovations. Schmid (1999) combines those

approaches where centre of excellence has a specific capability for one or several areas, is responsible for the markets in several countries with regard to these areas, and finally fully integrates in the MNC.

This paper searches for a new concept: the “integrated competence centre”. The focal point is the initial build-up of competence, where internal knowledge and learning processes combined with adoption from local science centres and advanced customers, result in *basic capabilities* that secures the mandates for further development. Integration is also highly important, as is the ability to participate in interorganizational networks. This approach does not include the marketing side of the subsidiaries, but targeting of the end product is still for a global sale.

4.0 The Importance of Autonomy in Competence Building

The ability to reach the competence status depends on the role of the subsidiary. Here the subsidiary’s knowledge relations and the functions of the R&D unit are important. Those factors secure necessary mandates. What is common for those factors is to a certain degree the autonomy status of the subsidiary in proportion to the headquarter. Autonomy reflects the strategic possibilities according to organizational placement in the structural context, Burgelman (1983), Birkinshaw and Morrison (1995). Through the structural context, the headquarter dictates the role of the subsidiary, but through autonomous actions the subsidiary changes strategies and in the end shape the structural context. Further, autonomy secures that the subsidiary starts to carry out precompetitive basic research not associated with any current production operations, Pearce (1996). Autonomous action therefore creates new product alternatives, Yamin (1999). In the first phase it is sometimes necessary to keep the first competence building process a secret so the knowledge resources can reach a level that puts the necessary pressure on the headquarters’ accept of the new mandate. Further, the managers of the subsidiaries must have some kind of influence on decision-makers in the headquarter that help the process of approval, Birkinshaw, Hood & Jonsson (1998). Gaining the mandate is therefore often a question of the political power or personal relations of the manager in the subsidiary. Autonomy therefore reflects ambitious managers with formal or informal political power.

The age of the subsidiary, or the placement in a classical evolutionary approach may affect the autonomy status measured in the degree of power and influence. The condition is that autonomy develops over time, Håkanson (1990). In the beginning a centralized management defines the strategy of the subsidiary, which often operates as a pure market channel. Over time independent product designs start because of special needs from local customers. Here the adaptation of technological, managerial and marketing expertise evolves. The autonomy status and influences on other units start rising. In the end the affiliate reaches a global status and obtains influence on the corporate strategy. This dealing with financial and strategic resources and influence is a self-increasing process, where the subsidiary gains more and more power. In situations where competence-building is successful, the subsidiary gains a status of credibility, and the headquarter will be more positive-minded about future projects concerning the specific unit, De Meyer (1993). Concurrently with credibility, trust gives political power. The development of competence is, in some industries, expensive and risky business, and mutual trust is a preposition for this to take place. Headquarters must be sure not to spend money on hopeless projects, Håkanson (1990).

However, an important assumption is that the evolutionary approach only covers classical greenfield establishment. By an acquisition the multinational corporations take over firms with superior competence, compared to themselves, and transfer of knowledge back to the headquarter starts immediately, Gammelgaard (1999). The headquarter can, of course, also decide to establish a high technology R&D centre as an independent unit. Here the subsidiary gains the mandate from day one.

5.0 Knowledge Relations

Although the subsidiary acts as an independent unit, knowledge building is often highly dependent on essential information from the outside. To develop a new basic design, the subsidiary often relies on a combination of new requirements from a local advanced main customer that gives R&D key personnel additional motivation and creative transitions, Pearce (1996). Further, external knowledge centres participate in

the development of the basic design. These knowledge relations graduate from follow-up services to customers, or redesigning products to specific local needs, to distinct capability development with professional customers. To fulfil those new demands the firm starts internal knowledge-creation processes building on an existing knowledge base and adds new knowledge from internal learning processes as well as knowledge transfers from local science centres. A basic element in the creation of new ideas is therefore, to adopt information from the outside and make it usable for a specific purpose. The “quality” of the geographical placement gives some subsidiaries advantages and incitements to develop into competence centres. An effective interdependence between the subsidiary’s technological work and host-country institutions may have sustained benefits for both actors that goes beyond short term problems, Papanastassiou and Pearce (1999). Proximity is an important factor, but there are many other advantages of placing R&D-units abroad. The traditional explanation is the proximity to natural resources, low labour costs, political and environmental factors, currency or tax. A newer approach is the ability to integrate with local research networks, such as scientific centres. Further, the better access to highly skilled scientific personnel is important. The purpose here is to adopt essential knowledge better than the headquarter because of contiguity, Tidd, Bessant & Pavitt (1997), Brockhoff (1998), Gerybadze & Reger (1998), OECD (1998). Further, foreign subsidiaries, with scanning resources, give access to new and sometimes unexpected knowledge of different markets, alternative solutions to problems, new sources of technology and insight into other cultures, because of local and alternative knowledge links, Yamin (1999).

After gaining the mandate things change because local knowledge should be usable in other corporate units. The subsidiary’s ability to translate and communicate knowledge is important. This adaptation process helps the subsidiary to start a co-operative development with other units. The subsidiary acts as an integrated player according to Gupta & Govindarajan (1994). In this type of subsidiary one finds high in- and outflows of information. The subsidiary acts as a creator and codifier of knowledge that is transferable to the entire corporation, but the integrated player

needs knowledge from the outside to play this role, and therefore a higher interdependency is necessary.

Tight co-operative and intraorganizational knowledge links between units are essential in the further development of core competences. Integration through socialization mechanisms, like job rotations, meetings, etc., are important factors, Kogut & Zander (1992) and Nohria & Ghoshal (1997), Cohendet et al (1999). Sharing knowledge modifies basic designs and makes them global. An essential problem here is transfer and codification of knowledge, e.g., Szulanski (1995).

6.0 The R&D Laboratory as a Competence-Builder

The basis for development of a new basic design is the existing stock of resources that come from an internal evolutionary upgrading of knowledge, Barney (1986), Dierickx & Cool (1989), or from the basic build up in the MNC in general. To reach this kind of competence level demands an independent exploitation of excess or slack resources in the subsidiary, Poynter & White (1985), Nohria & Ghoshal (1997). As long as the subsidiaries have to work hard to keep up with the strategic orders from the headquarter, or to fulfil procedural demands from the environment, building of new competences is a rare phenomenon. Excess resources are therefore essential to start up internal learning processes for capability building.

A basic assumption is the presence of resources. The next issue is the use of those. Very important here is the role of the R&D centre in the subsidiary and how this leads to superior products or processes transferable to other units. Ronstadt's (1978) typology of R&D roles was a kind of standard for many years for the structure of R&D units in MNCs. A structure relevant here is the "corporate technology unit", that generates new technology of a long-term or exploratory nature expressly for the parent. However, Ronstadt's typology does not include the environment and the intraorganizational network relations. A newer contribution is the Chiesa & Manzini (1996) typology of R&D structures. The first structure, which draws near the world product mandate status, is an "isolated and specialized" structure where the headquarter gives one foreign lab a top-to-bottom mandate. This unit has the full responsibility for developing a specific new product used on a global basis. There is

only one such centre kind in the corporation. The aim is to concentrate the resources needed for competence-building in one location, thereby reaching scale economics. The next structure contains a “supported and specialized” structure. There is one central unit with responsibility for developing R&D. The other R&D units, located abroad, act as information supporting centres, scanning the market for new knowledge to transfer back to the central R&D unit for utilization. The third structure is a “specialized contributor” which, organizationally, is similar to the supported specialized lab structure, with a centrally placed R&D unit. The difference is that very specific pieces of R&D are taking place in the different units, and the central unit assembles the transferred knowledge. The final approach is the “integrated lab” with independent R&D in the units but only in certain technological fields. There is still a central monitoring and supervising unit, but the independence results in a bottom-to-top situation. Therefore collaboration among units or between headquarter and subsidiary takes place in joint R&D-programmes. Common for all structures is the concentration of R&D into very specific areas in specific units compared to Ronstadt's more broad typology. Brockhoff (1998) deals with three structures in his archetypal typology. In the traditional corporation R&D takes place in a centralized unit. The advantages here are economics of scale and reaching a critical mass in utilizing scientific personnel. If the multinational corporation decides to decentralize into foreign labs, two ideal organizational structures exist. The first is the “competence centre”, where R&D is experimental, isolated and specialized. The research will mainly be based on internal learning processes or with local knowledge centres, but not with other units in the corporation. The aim is to develop unique core-competences fitted for the local customers. The contrast to this approach is the “network centre”, where the main strategy is to develop products for global sale. Here there are close ties among the different R&D intra-organisational units. Further, the network centre acts as a gatekeeper that monitors the environment for information, and thereafter translates important knowledge into a form understandable to other research groups. The characteristics of the network centre are tight controls, high subsidiary involvement in the formulation and implementation of strategies and close ties among the different R&D sites. The purpose is to capitalize

resources of various subsidiaries, to integrate assets and capabilities and to leverage unique innovations.

The last contribution mentioned here is Pearce & Papanastassiou (1996). In their approach R&D relates to the development of competences *per se*, so the results have a structure of basic design rather than final products. In “the specialized lab”, which is an even more narrow version of the competence centre by Brockhoff, the focus is on regeneration and extension of the group’s core technological competences. New key areas may emerge from that design. Here the subsidiary’s laboratory does not provide day-to-day support to others; instead they build research competence around scientific inputs that reflects the strength of the local scientific neighbourhood. A subsidiary can also end up as a knowledge niche, solving a particular problem or being R&D supporter in a certain area for the whole corporation.

To sum up, the R&D structure of the multinational corporation highly differentiates according to several factors. The first element is the question of “where”, the matter of centralization versus decentralization. If the multinational corporation chooses the decentralized structure, there are different roles that the subsidiary might play. The first distinction is whether the affiliates only act as knowledge adopter or does R&D physically takes place in the unit. If the latter, it may be a matter of following the top-to-bottom strategy; with centrally dictated tasks or the bottom-to-top strategy that reflect the autonomy structure, where competence-building arises from internal learning processes and local demands from essential customers. Finally, the role of the R&D unit is a question of being very isolated, going for unique basic designs of competence or the network model where intra-organizational corporation secures a less specific design more suited for a global utilization. Referring to the last distinction, the right solution could be somewhere in the middle as proposed in the integrated competence centre approach.

7.0 The Integrated Competence Centre

What does this term cover more precisely? In Brockhoff (1998) the distinction between the competence and the network centre outlines a paradox. If the aim of the

competence centre is to develop some kind of core competence, it might end with a too specialized design. Transfers become impossible and therefore products and knowledge are only useful for the local market. This structure might lead to needless product differentiation and unprotected competences, Boghani et al (1999). On the other hand, in the integrated network centre, competence-development might turn out not to be unique at all. The artifice is to find the right balance when walking on the tightrope between product developing and integration. The right strategy to follow is to bring in elements from these two extremities. One mix is the "integrated competence centre," that is a further development of the integrated lab as Chiesa & Manzini (1996) define it. Here, the autonomy R&D efforts only relate to certain technological fields that fit the corporate strategy. A bottom-to-top strategy ensures that new R&D approaches emerge instead of the more rigid adverse situation, where new ideas only come from the headquarter. The subsidiary that is able to develop unique designs persuades the headquarter to give mandates and resources for further development. At the same time, the headquarter supports the ideas that best fit the corporate goals, this selection improves the chances for integration in the long run. It is important to notice the very limitation in the first investigation of the subsidiary's first product design. After the approval, the effort of the R&D must open up, not only in design but also intra-organizationally, to bring in needed knowledge from other units in the development process.

The strategy of the headquarter, operating with a range of subsidiaries with different roles going from pure sales unit, information scanners to competence developer, is to secure integration of all units. Every unit acts as gatekeeper where the strategy is to transfer information and best practices around the corporation. The strategy related to the integrated competence centre is to use central monitoring and supervising that secure minor but necessary adjustments in the developing of core-competences. Integration is a success if intra-organizational networks of labs provide inputs into a centrally articulated research programmes and make a basis for a continued technological evolution of the multinational corporation by upgrading core competences from which future generations of innovative products can emerge, Pearce & Papanastassiou (1996).

8.1 Data Collection

To illustrate the emerging of competences in international subsidiaries and the following integration of knowledge in the corporation, I use two Danish firms that are both subsidiaries in huge foreign-owned multinational corporations. The data comes from interviews in the two firms. Further data comes from second hand information from annual reports, newspapers, Internet, databases etc. Both firms play the role of developer of new technological product design but differ in the assignment of mandates.

The pick-out of firms is due to a previous survey of foreign-owned subsidiaries in Denmark, Holm & Pedersen (1999). Both firms have a high ranking due to R&D efforts and to possessing of competence. The two firms have a very different history leading up to the competence status and further they are in two different lines of business. This methodological structure is on purpose, because the aim is to investigate some basic elements of gaining a mandate, developing basis structures and the following integration process.

8.2. Cases

Krüger is a consulting engineering company that offers equipment, technical solutions and operating activities for the industry and the public sector within environmental cleaning. Its core fields are potable water, wastewater, bioenergy, air-pollution control and mud combustion. Today there are 500 employees and the turnover is approx. US\$ 80 mill. where 50 % of which derives from international activities. Krüger has subsidiaries in seven European countries, Australia, Hong Kong and the US. The year of foundation was 1903 and in 1962 the Danish sugar and spirit company Danisco acquired Krüger. After a new acquisition in 1993, Krüger is now part of Vivendi, the French conglomerate corporation with 235.000 employees and activities within telecommunication, the TV-channel Canal+, building construction and environmental engineering. Krüger belongs to the division of waste water, which include the subsidiary O.T.V. Industries, which owns 70 % of the shares in Krüger. In this division there is also a development centre AR, which is a technological support unit for the other units.

Krügers main competence is to offer efficient cleaning solutions that cover all aspects of the cleaning process, from when the rainwater touches the ground to the final cleaning of the wasted water. The main strategy is to develop R&D “Flagships,” that is two or three very important areas. The purpose is to develop core-competences by concentrate resources within limited areas. Through the development process, Krüger co-operates with scientific centres and universities. Further, research programmes within the European Union and Danish governmental subsidies support the projects. The relations to customers are an essential incentive in the basic design phase. In the development of new products advanced customers agree to introduce not-finished products, and so participate in demand specifications. The demand for new products arises from a restrictive Danish environmental legislation, where firms and public institutions need high quality products. Later, because of a time-lag in the implementation of legislation in other European countries, and especially the rest of the world, the products of Krüger sell at these markets too, because the firm is now ahead of its competitors. This is an important commercial argument for gaining the competence mandate.

The mandate as a centre of competence is the result of a bottom-to-top development process. Proposals for new projects, which often arise because of a specific demand from a customer, have its first test of survival at the R&D-unit at Krüger. Besides a technological evaluation, the following analyses include commercial considerations. Further, the R&D-unit estimate the use of resources and the cost of those. Finally, they identify possible external and internal partners. After a certain time, OTV become part of this development phase. Krüger informs OTV of “what is going on” at official meetings, and the engineers at OTV give input like current information and viewpoints at these meetings, or by more informal personal network relations. Before appealing for the mandate, the R&D lab has the drawing of a basic design. Finally, there is a presentation of the results to the CEO in Krüger in form of a written introduction. This leads to the “official approval” of the project, which again leads to further analyses. At the end of this ongoing process, the approval comes from the board of directors in Krüger with the majority of French representation. Formally OTV own Krüger, but in practice they accept proposals from their Danish

subsidiary, because they have been part of the formulation of the project, and because Krüger's internal evaluation systems secure a profound investigation of the new "flagship" before the "shipbuilding" starts. This gives a good protection against the disadvantages of local based innovations. The building of new competences in the subsidiary is a slowly "ripening" process, where the French headquarter takes an active role and, in the end, the final approval is only formal.

The gaining of the mandate is not only a question of the permission, but to a high degree a matter of financial resources, because of a poor performance by Krüger in the years after the acquisition. Vivendi has therefore put a lot of money into the firm to finance the "flagship" development. The participation in EU-programmes was another source of financial resources for R&D.

The development of "flagships" is indeed competences that other parts of the corporation use. Several units develop competences, and it is common that other units participate in this process. Further, the use of the other subsidiaries as marketing units secures the global sale at local markets. The relations between firms are important when talking about integration of knowledge. Between OTV and Krüger there are tight personal relations. There are two official meetings per year concerning technical co-ordination and comparison of commercial opportunities of the products. Further, there are meetings in specialized technological groups. Before the meetings, reports are sent out on the corporation's intra-net. These meetings improve the technical exchanges in the corporation and the establishment of informal network connections too. Krüger also spread their information through the intra-net as well as gaining information from other units. A complete list of all the products in the corporation exists here with documentation and technological specifications. If other units need information from Krüger, this results in a send-out of engineering staff.

To sum up, the role of Krüger as a subsidiary fits in the Poynter & White (1985) terminology of a strategic independent unit with the freedom to develop new products as a result of a market-scanning process. However, the firm links much more to other corporate units than just financial and administratively. This participation in the differentiated network indicates a centre of excellence structure,

but without the market responsibility. In the end, the firm best fits in the proposed centre of competence structure, with the initial build-up of basic designs as a result of local knowledge resources and internal learning processes. The autonomy status is high, as a result of its 90 years outside the corporation. However, the firm moderates its behaviour through its participation in several official meetings with its owners. The R&D lab therefore fits in the Chiesa & Manzini (1996) terminology of an integrated lab, with specialized but monitored R&D and in the participation of joint R&D programmes. Computerized intra-nets and socialization mechanisms ensure an effective knowledge transfer and R&D corporation. What is special about Krüger, according to theory, is the lack of slack resources as the trigger of competence development, but here the firm draws on a historical tradition with customer-based development to fulfil legislation demands, and the ability to draw R&D resources from Danish and European environmental programmes.

LM Ericsson is the world's largest supplier of equipment for telecommunications with around 90.000 employees in more than 130 countries. 19.000 work in the R&D units, spread over 40 locations in 23 countries. One of them is LM Ericsson Denmark. The Danish subsidiary consists of three divisions: markets, operations and development. Out of 1.000 employees, 400 work in the development unit. Today the turnover is at US\$ 250 mill. US \$. The history of LM Ericsson Denmark reflects the evolutionary approach. The subsidiary is a greenfield establishment from 1929, whose purpose it is to act as a pure market channel. Gradually this focus changed in the 1960s to a more adapted view, where the subsidiary adjusted products to fulfil Danish customers' demand. This was very specific and local-oriented and the market opportunity was large enough to justify the establishment of an R&D laboratory in Denmark. The last ten years this unit has grown in importance, measured in the numbers of employees. This figure rises from 30 at the time of establishment to 150 in 1990, 300 in 1995 and finally 400 in 1999.

LM Ericsson Denmark produces several products within telecommunications such as "intelligent networks & traffic control and service telephony systems. The focus here will be on intelligent networks when referred to R&D. The technological environment in this industry changes very quickly. Sometimes the "time of

development” is only 3-4 weeks, where previously 1 year was the standard. The strategy of the corporation is to develop global standards within telecommunication where only minor local adjustments are necessary. This structure is prevailing in the Danish subsidiary too, where global design of intelligent net is in focus of development. To fulfil its goals the headquarter chose the top-to-bottom strategy. LM Ericsson in Sweden takes the initiative to give a mandate to a specific subsidiary. Possessing a mandate follows the Galunic & Eisenhardt (1996) approach, with the global responsibility within certain product areas, extended to service, maintenance, customer training, but without the sales commitment, which local sales units takes care of, Forsgren, Mathiesen & Pedersen (1999). In fact, in Ericsson Denmark, the R&D unit develops product for global use, but the marketing unit may only sell to within the area of Denmark, Greenland, The Faroe Islands, Iceland and Lithuania.

Sufficient financial support to cover the R&D cost follows the assignment of a mandate. This creates a situation where subsidiaries compete against each other to gain the mandate. To pick out the right candidate the corporation uses a rating system. A high rating qualifies the subsidiary to participate in future R&D-programmes. Further, the rating system, with measurement of technological development ability, cost of development, market understanding and production quality, create competition and thereby improve the performance in the subsidiaries, Forsgren, Mathiesen & Pedersen (1999). Subsidiaries, wanting to become competence centres, must develop autonomy so headquarters can recognize them. Intra-organizational relationships personal networks and other political pressures, are important here, Forsgren, Mathiesen & Pedersen (1999).

In principle, the headquarter decides the R&D strategy and where this R&D is going to take place. Next, they distribute resources that totally cover the cost. In practice there is, however, an element of the bottom-to-top-strategy. To qualify for the mandate subsidiaries themselves build up internal knowledge and network relations. Further, they are able to make suggestions for future product-development or other technology solutions and then the headquarter assigns the task. An example is that LM Ericsson Denmark for several years built up knowledge in intelligent nets before they gained the mandate for further development. Further, they participated

in several EU research frame programmes to upgrade competences. The Swedish headquarter was not a part of this process and the Danish subsidiary joined the programme without asking for approval from the headquarter. Instead the request from a major customer on the Danish market was the incentive to join this R&D network. This shows a more autonomous R&D profile. The presence of organizational and financial slack further improves the competence development process. From 1995-1998 the turnover doubled and the profit went from 3 to 12 %, which extends the R&D unit considerably. In this situation it is possible to begin the development of basic design without asking for resources.

The question is whether the headquarter decides that the product area “intelligent net” should be a future competence area, because of the already existing knowledge base in the Danish subsidiary, and then the assignment of the mandate is a mere formality. The answer to the question is probably ambiguous. However, it is a fact that LM Ericsson Sweden has a very centralized organization of R&D achievements despite the fact that only 35 % of the R&D takes place in Sweden. The mixture of a centralized organization with autonomous units is not a new organizational management system, but rather the result of a long-lasting tradition, e.g., already described in Prahalad & Doz (1987). The concept of an independent but governed subsidiary finds its practice in the mid-eighties, and the Ericsson corporation was among the few firms operating with the idea of distributed excellence in the Bartlett & Ghoshal (1986) study. Well known is the case of the Australian subsidiary, acting as a “contributor” by developing the AXE digital telecommunication switch, despite the geographical disadvantage of a placement at a strategically unimportant market.

The development and documentation of new telecommunication systems follow some centrally guided formal common rules. The central R&D units, placed in Sweden, govern the development process in the different subsidiaries and check that they follow a generalized structure. Further, they transfer information to subsidiaries, and help with the following implementations of strategies. There is a central education of staff too, which strengthens the internal network. The organizational placement of the Danish R&D unit reflects this centralization.

Although the unit is under the command of the Danish CEO, they develop products for the headquarter rather than for the Danish company. Further, the CEO of the product division in Sweden can dictate tasks too. The unit that develops intelligent net is like a company within the company, the strategic management unit is placed in Sweden, but the unit is responsible for its budget, and other subsidiaries with contact to local customers attend the final sale.

There is no doubt that LM Ericsson Denmark's knowledge base qualifies them to be a competence centre. The area is specific, and still monitored to fit the overall strategy. Further, there is integration of competence as well. The fight for mandate could create a competitive structure with no wishes for integration, but the market for telecommunication is so large that Ericsson corporation alone cannot fulfil its demands. There is no commercial reason for rivalry, but more a need of utilizing each other's knowledge and capabilities to make products. Integration of competence is therefore essential. The whole corporation uses a world wide card pointing out where different kinds of competence exist in the corporation. All information is to everybody. In the gathering of information the unit uses its informal contacts. By using international rotation of employees, engineers get in touch with each other, and often new knowledge arises by exchanges of information. The integration of the development divisions is successful; they know each other and share information. Nohria & Ghoshal (97) describe the communication system within and among units of the Ericsson corporation as rich and frequent creating considerably information flows among the subsidiaries. However, in the end the knowledge transfers often consist of concrete solutions to a practical problem, and the fundamental core competence remains in the subsidiary, which in a way protects its position as a competence centre.

To sum up, LM Ericsson Denmark builds up competences on their own initiative, and thereby qualify for the mandate. However, with the centralized organization there is an opportunity of placing the mandate elsewhere. The defining of competence areas follows two ways. Sometimes it follows a pure top-to-bottom strategy, where there is no initial competence in any subsidiary, and the headquarters distribution of mandate is politically driven, and subsidiary gain charters through

power and relations, Forsgren, Mathiesen & Pedersen (1999). In the Ericsson Denmark case, the subsidiary qualified through an independent build up of competence, and this moderates the top-to bottom decision. The subsidiary seems to possess the responsibility of a world product mandate without the sales activities, but with a concentrated effort on making standardized and global-oriented products from the very beginning. The further development fits in the centre of competence definition, with a very high integration in the corporate knowledge network. The history of the firm follows the traditional evolutionary approach, where a status of credibility and trust, combined with the existence of slack resources for initial basic design development, helps the firm in getting useful mandates. From the outside, it seems that the R&D units fit in the Ronstadt terminology acting as a corporate technology unit making products for the parent, but the corporation managed to find the right balance between superiority and global sales, so the subsidiary reaches the status of a moderately integrated competence centre, because of a minor importance of joint R&D programme.

9.1 Conclusion

The two case studies both end up with subsidiaries acting as integrated competence centres, but as the table shows, the way to reach this status follows quite different ways.

Table 1. Different characteristic of Krüger and L. M. Ericsson Denmark

	Krüger	L. M. Ericsson Denmark
Establishment	1904 as an independent firm. Acquired in 1962 by Danisco and in 1993 by Vivendi	Greenfield establishment from 1929
Business relations to headquarter	Unrelated to Vivendi. Related to OTV	Related to L.M. Ericsson, Sweden
History	Independent build-up of autonomy and knowledge outside the present owner	Traditionally evolutionary path going from pure sales channels to product developing firm

Product and sales orientation	50 % local market	Global market.
Mandate	Bottom-to-top	Moderated top-to-bottom
Slack Resources	No, but connected to EU programs	Yes
R&D Unit	Integrated lab	Corporate technology unit/ Moderated integrated lab
Knowledge relations	Local advanced customers and EU research programmes	EU research-programmes
Knowledge diffusion	Intra-net and meetings	Intra-net and job rotation
Role	Strategic independent unit - centre of competence	World product mandate - centre of competence

The table shows a lot of differences between the two firms, which to a high degree is a result of a historic process. Still, what is common for both of them is the ability to build up competence, and the central theme here is a high degree of autonomy. Both firms manage to start up innovative processes, without the approval from the headquarter, and both firms qualify for the mandate for further competence development. In fact, the case study shows that playing the role as a centre of competence depends on the autonomy actions, the role of the R&D unit, the external knowledge relations and the ability to integrate with other units of the corporation. A basic assumption is therefore that subsidiaries must to a certain degree live their own life if they are going to develop into integrated competence centres.

Subsidiaries do not necessarily any longer act like identical replications of the headquarter on smaller scale, but more like independent units that follow some overall strategic and cultural rules. Therefore the headquarter does not anymore always appoint time and place of innovations, but to a higher degree respond to creative processes when it's there. This strategic context of centre of competence subsidiaries with the proximity to a local knowledge base and independent, and alternative, learning processes, better exploit the specific advantage of the MNC with its global distribution of units.

9.2. Discussion

Distributing mandates for competence-building to foreign subsidiaries is a new strategy growing in importance since Bartlett & Ghoshal found the germinating elements of this structure back in 1986. However, to shift the approach from a knowledge-centralized structure in MNCs to a decentralized structure just open up another black-box of unanswered questions. The advantage of the top-to-bottom strategy consists in the control of the knowledge-creating process, but this approach suffers from the outselection of foreign local knowledge network relations and autonomy superior internal learning processes in subsidiaries. The opposite bottom-to-top strategy improves uniqueness but the problem here is to control the process. How can a very local-oriented product develop into a global design, and which design should the headquarter choose for further development, and how is it possible to determine the future of a local basic design on a global market?

The answer is to introduce organizational structures, like, e.g., the differentiated network as proposed by Nohria & Ghoshal (1997), but this just leads to new problems like what is the effect of breaking into a promising knowledge developing process in a subsidiary. Does the subsidiary lose something by the integration process, when other units participate? Do things change drastically in knowledge transfers and socialization mechanisms. It is out of the scope of this paper to give answers to those questions. The two case-studies, however, show examples of two foreign-owned subsidiaries succeeding in reaching a competence status by focusing at an autonomous build-up of basic designs together with local knowledge resources, and after the gaining of the mandate, using a more interorganizational integrative strategy in the further knowledge development.

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