

■ Research Article

Knowledge Creation and Transfer in a Cross-Cultural Context—Empirical Evidence from Tyco Flow Control

Florian Kohlbacher^{1*} and Michael O. B. Krähe^{2†,‡}

¹German Institute for Japanese Studies, Tokyo, Japan

²Häfele Japan K.K., Yokohama, Japan

The capability of multinational corporations (MNCs) to create and efficiently combine knowledge from different locations around the world is becoming increasingly important as a determinant of competitive advantage and will be more and more critical to their success and survival. Consequently, cultural differences and cross-cultural contexts play an essential role for and significantly influence global knowledge creation and management. This paper presents a case study resulting from a current empirical research project on knowledge management and the transfer of knowledge within organizations of MNCs. We describe and analyze the efforts of global market leader Tyco Flow Control (TFC)'s Japanese subsidiary KTM to transfer relevant—and often highly tacit—knowledge to a newly acquired production site in Taiwan. Challenges and difficulties encountered in the process of global knowledge management—in this case the transfer of knowledge from Japan to Taiwan—as well as the creation of new knowledge locally and its feedback—are illustrated and carefully examined. Finally, we discuss our findings and highlight practical implications for managers and international corporations in a global business environment. Copyright © 2007 John Wiley & Sons, Ltd.

INTRODUCTION

Bartlett and Ghoshal (2002: 3) start their seminal book on managing across borders with the statement that the world's largest companies are in flux and that '[n]ew pressures have transformed the global competitive game'. Indeed, '[v]irtually all business conducted today is global business'

(Thomas, 2002: 3), national economies have become increasingly deregulated and have opened up opportunities for international trade and competition so that it has 'become the norm for organizations to compete for market share not only with their national competitors but also with international ones' (Trompenaars and Woolliams, 2004: 27). These '[r]apid changes in the nature of global competition have driven international managers and management researchers to search innovative ways to approach new challenges, tackle problems, and answer questions as to how to manage complex multinational corporations (MNCs) most effectively' (Tseng, 2006: 120). Furthermore, '[i]n today's hyper-competitive global marketplace it is pivotal for enterprises to manage not only tangible resources

*Correspondence to: Florian Kohlbacher, German Institute for Japanese Studies (DIJ), Jochi Kioizaka Bldg. 2F, 7-1 Kioicho, Chiyoda-ku, Tokyo 102-0094, Japan.

E-mail: kohlbacher@diptokyo.org

[†]President.

[‡]Michael O. B. Krähe was COO and later Managing Director of Tyco Flow Control Japan and KTM from July 2003 to December 2005.

but also to exploit intangibles' (Desouza and Evaristo, 2003: 62). In this context, scholars and practitioners around the globe have identified the capability of MNCs to create and efficiently transfer and combine knowledge from different locations worldwide as an increasingly important determinant of competitive advantage, corporate success, and survival (cf. e.g., Asakawa and Lehrer, 2003; Desouza and Awazu, 2005; Gupta and Govindarajan, 2000; Schulz and Jobe, 2001).

This paper aims at contributing to the field of transfer and creation of knowledge in a cross-border as well as cross-cultural context by presenting and analyzing a case study of a US American MNC's Japanese subsidiary's efforts to transfer relevant—and often highly tacit—knowledge to the manufacturing operations of another newly acquired subsidiary in Taiwan. First, we will give a brief review of the extant literature on global knowledge management and transfer and also take a look at cross-cultural issues as well as knowledge transfer and inter-organizational learning in cross-border acquisitions. Then, the empirical study and research methodology will be introduced. Subsequently, we will depict the case of global market leader Tyco Flow Control (TFC)'s Japanese subsidiary's knowledge transfer to Taiwan. Subsequently, we will analyze and discuss the case within the theoretical framework given in the first part of the paper and highlight practical implications for managers and international corporations in a global business environment. Last but not least, limitations to the study as well as the need for further research will be indicated.

THEORETICAL FRAMEWORK

Transfer of knowledge in MNCs

According to Bresman *et al.* (1999: 440), the process of knowledge transfer between business units is an essential aspect of knowledge management, and Tseng (2006: 121) notes that knowledge transfer capability is one of the most important advantages of MNCs and that '[t]hrough the transfer and adaptation of knowledge, subsidiaries of MNCs build and develop their competitiveness over local firms'. Indeed, the management of knowledge flows is especially important for MNCs because they operate in geographically and culturally diverse environments (Schulz and Jobe, 2001). Since strategically important knowledge is geographically dispersed in the business environment of most global firms (Asakawa and Lehrer, 2003), MNCs can derive great competitive advantage by managing

knowledge flows between their subunits with differences between local markets requiring adaptation of products and operations to local conditions (Schulz and Jobe, 2001). Minbaeva *et al.* (2003: 587) contend that the competitive advantage that MNCs enjoy is contingent upon their ability to facilitate and manage intersubunitary transfer of knowledge and define knowledge transfer between organizational units as 'a process that covers several stages starting from identifying the knowledge over the actual process of transferring the knowledge to its final utilization by the receiving unit'.

Gupta and Govindarajan (1991: 773)—who describe MNCs as a network of capital, product, and knowledge transactions among units in different countries, a perspective which is also consistent with the analyses of Bartlett and Ghoshal (2002) for example—use the term intracorporate knowledge flow and define it as 'the transfer of either expertise (e.g., skills and capabilities) or external market data of strategic value'. In a further study, they were able to show that a complete mapping of the knowledge transfer process within MNCs requires attention to all of the following five major elements: value of the knowledge possessed by the source unit, motivational disposition of the source unit regarding the sharing of its knowledge, the existence, quality, and cost of transmission channels, motivational disposition of the target unit regarding acceptance of incoming knowledge, and the target unit's absorptive capacity for the incoming knowledge (Gupta and Govindarajan, 2000). In particular, 'the context specificity of the knowledge has an effect on the extent of knowledge transfer, both because the more context specific the knowledge is, the smaller the absorptive capacity of the received and the less it can be used in other MNC units' (Foss and Pedersen, 2002: 64).

Minbaeva *et al.*'s (2003) most important finding of their study for instance, is that both aspects of absorptive capacity (ability and motivation) need to be present in order to optimally facilitate the absorption of knowledge from other parts of the MNC and that employee ability or motivation alone does not lead to knowledge transfer. Contrary to studies that blame primarily motivational factors, Szulanski's (1996) findings on internal stickiness in turn, show the major barriers to internal knowledge transfer to be knowledge-related factors such as the recipient's lack of absorptive capacity, casual ambiguity, and an arduous relationship between the source and the recipient (cf. also Szulanski, 2003). In fact, whether or not the evaluation of the knowledge results in its integration in the organizational knowledge base depends on the learning effectiveness or absorptive capacity of the organiz-

ation. Inkpen (1998, 2000) describes three factors influencing the learning effectiveness—knowledge connections (such as foreign assignments or visits by personnel) between the partner firms to build networks, relatedness of partner knowledge, and the cultural alignment between parent executives and alliance managers.

Moreover, knowledge is ‘simultaneously highly sophisticated (both tacit and explicit) and widely dispersed in the hands and minds of many, and is not easily produced or captured inside the boundaries of one or a few firms’ (Ciborra and Andreu, 2001: 78). Nonaka (1990: 82) terms the cross-border synergistic process of joint knowledge creation as ‘global knowledge creation’ and sees it as the key process of globalization. Here again, ‘[t]acit knowledge, embodied in individual, group, and organizational routines, is of critical strategic importance because, unlike explicit knowledge, it is both inimitable and appropriable’ (Al-Laham and Amburgey, 2005: 251; Spender, 1996).

Last but not least, inter-organizational trust also plays an important role for the accessibility of knowledge. Indeed, only in a climate of trust, organizations will be ready to put their knowledge at the disposal of their partner organizations (Weir and Hutchings, 2005). DeLong and Fahey (2000: 119) put it like this: ‘The level of trust that exists between the organization, its subunits, and its employees greatly influences the amount of knowledge that flows both between individuals and from individuals into the firm’s databases, best practices archives, and other records’.

Cross-cultural issues in global knowledge-based management

According to Weir and Hutchings (2005: 89), ‘[a]ll management behavior takes place and all management attitudes are rooted in a specific cultural context’ and ‘[k]nowledge cannot be understood outside of the cultural parameters that condition its emergence and modes of reproduction’. However, ‘[o]ne of the problems in the knowledge management literature is that authors give the impression that knowledge management operates in a kind of unitary vacuum, in which diversity in terms of language, cultural and ethnic background, gender and professional affiliation are compressed into one giant independent variable, which is in any case pushed to the side’ (Holden, 2002: 81). Indeed, despite the fact that the number of empirical studies investigating various aspects of knowledge transfer within MNCs has significantly increased during the last years, very few conclusions about the influence of culture on knowledge transfer have been reached

so far (Haghirian, 2003). However, the ‘task of integrating disparate pockets of knowledge within a firm is complicated by the fact that enterprises operate in a global context’ as knowledge is ‘spread over a wider spectrum and is meshed in a broad assortment of contexts’ (Desouza and Evaristo, 2003: 62). Specifically considering the international or global transfer of knowledge, Bresman *et al.* (1999) have found certain factors like the lack of personal relationships, the absence of trust, and cultural distance all combine to create resistance, frictions, and misunderstandings in international acquisitions. Cultural distance has been defined as ‘the sum of factors creating, on the one hand, a need for knowledge, and on the other hand, barriers to knowledge flow and hence also for other flows between the home and the target countries’ (Luostarinen, 1980: 131–132, cited in Barkema *et al.*, 1997: 427–428). Johanson and Vahlne (1977: 24) use the term psychic distance and define it as ‘the sum of factors preventing the flow of information from and to the market’, with examples being ‘differences in language, education, business practices, culture, and industrial development’.

From the above, it is obvious that cultural differences and the cross-cultural context play an important role for and influence global knowledge creation and management (cf. e.g. Desouza and Awazu, 2005; Desouza and Evaristo, 2003; Holden, 2001, 2002; Weir and Hutchings, 2005). Zhu (2004: 74) for instance questions the popular claim that knowledge management is becoming a universal management concept and correctly notes that such a universal concept would not only be unrealistic but even counterproductive and thus undesirable as well. However, the problem how cross-cultural differences influence knowledge management has received too limited research attention so far (Desouza and Evaristo, 2003; Edwards and Kidd, 2003; Ford and Chan, 2003; Zhu, 2004) and ‘the literature is almost silent on knowledge management in its cross-cultural dimensions’ (Glisby and Holden, 2003: 29). In conclusion, it can be said that knowledge sharing and usage behavior vary across cultures and that it is difficult to come up with global standards and protocols on how to initiate knowledge management (Desouza and Evaristo, 2003: 65).

Global knowledge creation, management, and transfer in acquisitions

During the past 30 years there has been sustained multidisciplinary research in deciphering the causes of M&A performance, with growing emphasis being placed on organizational integration and

human resources issues (Stahl and Mendenhall, 2005). However, while considerable attention has been given to questions of knowledge transfer within a single company, knowledge transfer in alliances and joint ventures, and knowledge transfer between independent firms, knowledge transfer in acquisitions has received very little attention (Bresman *et al.*, 1999), and, if it has, mostly in the context of the potential of acquisitions as a means of gaining access to new knowledge (cf. e.g. Huber, 1991; Pablo and Javidan, 2004; Vermeulen and Barkema, 2001; Zollo and Singh, 2004). Indeed, 'since not all critical knowledge resides inside firm boundaries, firms have to tap into external resources of knowledge to develop competitive advantage' (Al-Laham and Amburgey, 2005: 251; cf. also Cavusgil *et al.*, 2003; Desouza and Awazu, 2005). Obviously, international joint ventures and other kinds of alliances are a case in point here as they have often been considered a central source of new knowledge (Desouza and Awazu, 2005; Gulati *et al.*, 2000; Hamel, 1991; Khanna *et al.*, 1998; Lyles, 1994) and access to the capabilities of the partners has been emphasized as a central motive for such 'learning alliances' (Badaracco, 1991; Child *et al.*, 2005; Lubatkin *et al.*, 2001). Firms also increasingly choose acquisitions as a faster and more comprehensive means to access locally embedded, tacit knowledge (Barney, 1999; Westphal and Shaw, 2005). These kinds of acquisitions have also been termed 'knowledge-based' acquisitions (Child *et al.*, 2001).

As a matter of fact, learning and knowledge management have become a key alliance research issue in recent years (cf. e.g. Desouza and Awazu, 2005; Inkpen, 2002; Inkpen and Currall, 2004). Since alliances can be defined as 'any inter-firm cooperation that falls between the extremes of discrete, short-term contracts and the complete merger [or acquisition] of two or more organizations' (Contractor and Lorange, 2002: 486), we acknowledge that concepts from alliance learning research might also provide helpful insights for knowledge and learning issues in acquisitions, but a detailed analysis and discussion of this would go beyond the scope of this paper.

Basically, three different processes of knowledge transfer or inter-organizational learning can be assumed in acquisitions. These processes can take place simultaneously, consecutively or reiterative and overlapping. Besides, not necessarily all three processes occur. In fact, as mentioned above, most of the extant literature has focused on the knowledge transfer from acquired firm to acquiring firm—that is, accessing and acquisition of knowledge by the acquiring firm, cf. process (3) in Exhibit 1—which leads to the assumption that in many mergers and acquisitions, there is only unilateral flow of knowledge. By contrast, there might also be the case of mutual learning—also called 'reciprocal learning' as in the case of so-called 'learning alliances' (Lubatkin *et al.*, 2001)—and mutual knowledge creation—knowledge co-creation—between acquiring and acquired firm (cf. process (2) in Exhibit 1). Finally, there is the case of transferring knowledge from the acquiring firm to the acquired firm (cf. process (1) in Exhibit 1).

This paper looks at the case of transferring knowledge from acquiring to acquired firm—or that is, actually between two independently conducted acquisitions by TFC in short consecution—and aims at contributing important insights on knowledge creation and transfer within MNCs after (cross-border) acquisition of new units. By analyzing a case study of process type (1)—transfer from acquiring firm to acquired firm—we intend to help closing the gap in the extant literature and the dearth in empirical research on the transfer from acquiring firm to acquired firm. In our case, the process of knowledge transfer subsequently turns into type (2)—mutual learning and knowledge co-creation between acquiring firm and acquired firm and type (3)—transfer from acquired firm to acquiring firm.

Desouza and Evaristo (2003: 62) have identified the fact that 'the researchers were not primarily concerned with understanding knowledge management intricacies in a global context' as a key limitation of studies on global knowledge management. Taking a cross-cultural perspective of global knowledge creation and transfer, we try to overcome this

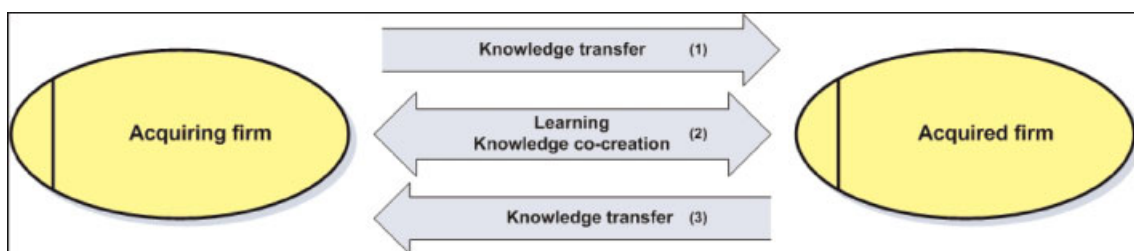


Exhibit 1 Processes of knowledge transfer and inter-organizational learning in acquisitions. Copyright Florian Kohlbacher, 2006

limitation and are thus exploring a 'new frontier of knowledge management' (Desouza, 2005). We describe and analyze the efforts of global market leader TFC's Japanese subsidiary to move manufacturing of a certain product range from its Japanese site to the manufacturing operations of a recent acquisition of a Taiwanese company by TFC. The manufacturing relocation starts with the uni-directional knowledge transfer and challenges and difficulties encountered in the process of global knowledge management as well as the creation of new knowledge locally and its feedback—which are illustrated and carefully examined.

RESEARCH METHODOLOGY

The case study and the findings presented in this paper are derived from a comprehensive empirical research project on knowledge management, knowledge creation, sharing, and organizational learning within MNCs. In order to analyze the process of knowledge creation and transfer in MNCs, our study adopted an exploratory research strategy. Indeed, qualitative research, rather than traditional quantitative empirical tools, is particularly useful for exploring implicit assumptions and examining new relationships, abstract concepts, operational definitions, and organizational processes, as well as outcomes (cf. e.g. Bettis, 1991; Cassell and Symon, 1994; Weick, 1996).

One important objective of the empirical study was to identify and analyze firms and cases that seemed to be most appropriate to provide insights into knowledge management and transfer processes. Therefore, we opted for purposive sampling (purposeful sampling) which is essentially strategic and entails an attempt to establish a good correspondence between research questions and sampling, as the researcher samples on the basis of wanting to interview people who are relevant to the research questions (Bryman, 2004; Patton, 2002). According to Patton (2002: 230, original emphasis), the 'logic and power of purposeful sampling lie in selecting *information-rich cases* for study in depth', with information-rich cases being 'those from which one can learn a great deal about issues of central importance to the purpose of the inquiry'. In fact, '[s]tudying information-rich cases yields insights and in-depth understanding rather than empirical generalizations' (Patton, 2002: 230). We purposefully identified and selected our informant companies through both a review of the relevant literature and exploratory empirical research. Indeed, TFC has been identified as a specifically interesting and insightful example for studying knowledge creation

and transfer in a cross-border and cross-cultural context.

Another goal was to conduct an analysis of different patterns and ways of knowledge creation, management, and transfer within MNCs that helps to develop new hypotheses and build theory on how companies can efficiently and successfully do so and thus contribute to the theory of knowledge creation in an international context and to develop constructs that facilitate future hypothesis testing. The fact that case studies have an important function in generating hypotheses and building theory (cf. e.g. Eisenhardt, 1989; Yin, 2003) was thus another reason for choosing a case study research strategy.

According to Yin (2003: 2) 'the distinctive need for case studies arises out of the desire to understand complex social phenomena' because 'the case study method allows investigators to retain the holistic and meaningful characteristics of real-life events', such as organizational and managerial processes, for example. In fact, '[o]rganizations constitute an enormously complex arena for human behavior' (Dubin, 1982: 379) and case studies seem to be the preferred strategy when 'how' or 'why' questions are being posed when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context. In such a setting, case studies are explanatory ones, that is, they present data on cause-effect relationships, explain how events happened, and extend theoretical understandings (Yin, 2003). Indeed, using the 'force of example' (Flyvbjerg, 2006), TFC's case serves as such an explanatory case study in order to illustrate and analyze the essential mechanism of cross-border knowledge creation and transfer.

The research was conducted over a period of more than 1 year and involved triangulation among a variety of different sources of data including the conducting of both formal and informal on- and off-site interviews with managers as well as scholars and other experts in the field, analysis of archival materials such as company internal documents as well as articles in the business media and an evaluation of existing case studies, and other relevant literature (Yin, 2003). In total, qualitative interviews with more than 100 top executives, middle managers, and selected employees in more than 30 different MNCs—Japanese, European, and US American—have been conducted in 2005 and 2006 mainly in Japan. As for the TFC case, Michael O. B. Krähe was Chief Operating Officer (COO) of TFC Japan and KTM from July 2003 to December 2003 and Managing Director from January 2004 to December 2005. Additionally, interviews with the

Deputy Division Manager of the Manufacturing Division and the Division Manager of the Engineering Division were conducted since both were heavily involved in the project described below and could provide different points of view. In the course of these qualitative interviews, semi-structured questions in accordance with the theory of organizational knowledge creation and enabling were employed, but the interview partners could nevertheless answer openly and lead the interview mostly. All interviews were recorded and authentically transcribed.

KNOWLEDGE CREATION AND TRANSFER IN A CROSS-CULTURAL CONTEXT: THE CASE OF TYCO FLOW CONTROL

Tyco International Ltd is a diversified US American conglomerate with an annual turnover of \$39.7 billion and 250 000 employees. Within this MNC, TFC is a business unit and global market leader in industrial valve manufacturing, supplying valves for global companies such as Dow Chemicals, Shell, BASF, and others. TFC has, in the course of its M&A activities, acquired KTM, a Japanese valve manufacturer in 2000 and Taiwan Valve Corporation (TVC) in 2001. Whereas KTM is engaged in the production of high-quality ball valves, TVC was a mass producer of OEM ball valves. Due to the high production cost in Japan, the TFC management decided to partially move production from KTM to TVC in 2001. This strategy was influenced by the goals of cost reduction, available manufacturing, and organizational resources within different units of TFC and the judgment, whose knowledge can be transferred within this MNC's organizations. 'Hard

resources', rather than motivational disposition and absorptive capacity to openly transfer, receive, and share the required knowledge subjected the decision making.

The Asian regional head office of TFC (TFCA) was in charge of managing both business units involved in the manufacturing relocation and knowledge transfer (Exhibit 2 gives an overview of the organizational structure of Tyco International Ltd). Under the broad guidelines given by the TFC management, TFCA detailed the project goals, responsibilities, available resources, and time schedules and communicated them to the management of the local business units. Not only the issues of different languages in the knowledge transfer process (i.e., English, Japanese, and Chinese), but also the issues of different national and organizational cultures exerted crucial influences in the following local execution of the project.

In the course of manufacturing relocation, the complete design and manufacturing knowledge had to be transferred. In a first step, the codified knowledge in the form of the relevant engineering documentation was sent to TVC to be redrawn in Chinese. KTM Engineering checked the drawings for correctness and necessary corrections were marked. The drawings were then redrawn at TVC, resulting in a 're-codification' within a different cultural and lingual context. During the discussions that were held between KTM and TVC engineers, the technical reasoning became clear to the TVC engineers. In return, the KTM Engineering staff became knowledgeable about the main design factors influencing cost. Whereas KTM was traditionally focusing on quality requirements during a period when Japanese production cost was low compared to European or US American competitors and therefore a lesser issue, TVC entered the market

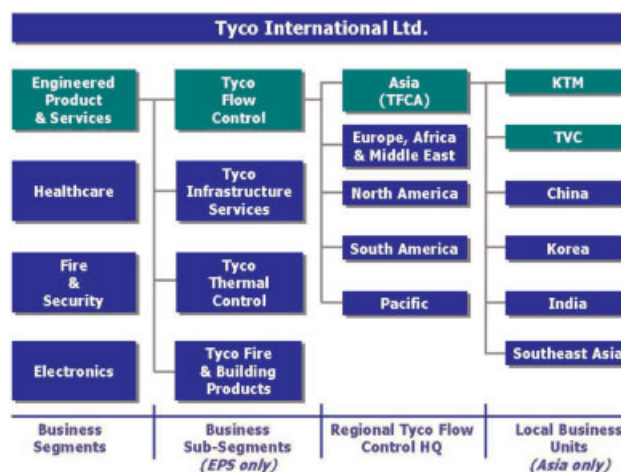


Exhibit 2 Organizational structure of Tyco International Ltd

at a later stage and it was essential for its survival to mass produce ball valves at low cost.

While communication on the level of the Japanese and Taiwanese engineering counterparts was conducted directly with the help of translators, the management of the project by TFCA required the compilation of English documents. This in turn required additional organizational resources and frequent meetings between the local business unit leaders and TFCA to record major decisions and deviations from the original project as the goal was to have a continuously updated project schedule on hand which served as a reference guide. For the English-speaking TFCA management the main purpose of the project schedule was to follow-up the timely implication of every step of the reallocation process such as design, component sourcing, manufacturing, sample production, and release of production lots. Rather less importance was given to the issues of quality assurance and production cost management. It was assumed that these issues would be taken care of by the local business units in follow-up actions when the local business unit was already focusing on the next step of the project. The emphasis on timely execution can be found according to our research in many Anglo-American MNCs, where fast product innovation cycles and rapid penetration of markets are considered key strategy elements.

After all necessary drawings were completed by TVC and approved by KTM, the second step was initiated which comprised of identification, training, and quality control of local Taiwanese sub-suppliers as all parts were to be locally sourced. Whereas in the first step, codified knowledge was transferred across the units of the MNC, the second step included the transfer of selected portions of this knowledge to various sub-suppliers outside of the MNC. For many younger KTM engineers this was the first opportunity to get first-hand knowledge about production methods outside of Japan. So far the Japanese KTM sub-suppliers provided the scale on which to measure their Taiwanese counterparts. These Japanese sub-suppliers had proven their high product quality and there was no reason for the KTM engineers to deviate from any detail, explicitly or tacitly understood. As they experienced a different method of production in Taiwan, the first reaction was naturally a position of defense. However, during the discussions, they were forced to logically substantiate their arguments and virtually left their cognitive home ground.

As the KTM engineers stayed periodically for a week or more, they had sufficient time to engage in discussions during work and while socializing afterwards. These 'after-hours communications'

proved to be another fruitful opportunity to tacitly understand the position of both sides and it was easier for them to become convinced that some proposals might provide the appropriate alternative to achieve both targets of the project: high quality and cost reductions. Hereby, new knowledge was created and brought back to Japan where it was discussed between KTM and their Japanese sub-suppliers. The knowledge of Taiwanese production methods was disseminated in Japan to these suppliers and provided the basis to integrate Taiwanese production cost know-how into quality-focused manufacturing.

For the Chinese-speaking Taiwanese engineers involved, selection of suitable sub-suppliers was the pivotal focus of the project as a large portion of the manufacturing cost of the products was tied to component supply. Sub-suppliers relations already existed within Taiwan and TVC felt confident with the quality and cost provided by their sub-supplier base; there was a lesser need to provide explicit knowledge and intelligence to their KTM counterparts. Whereas the Anglo-American emphasis of timely execution was met by the general TVC approach, the Japanese preference of quality control was not: KTM required a constant flow of quality-related documentation combined with frequent visits and inspections of the sub-suppliers. The continuous demands of the Japanese engineers to tacitly understand the sub-suppliers and receive knowledge of manufacturing capabilities and standards by inspections, audits, and one-on-one meetings, were seen as an obstacle in timely execution of the project by TFCA.

As a final step, the assembly, pressure-testing, packing, and shipping had to be designed for the production facility in Taiwan. Each assembly process steps had to be taught to the Taiwanese staff at the production location by experienced workers from KTM. For this purpose, staff was dispatched from KTM. In contrast to the KTM and TVC engineers who were communicating in English and on the basis of drawings and other engineering records, KTM and TVC workers were relying on verbal communication, intermediate translation, and direct presentation by hand.

Typically, KTM workers are employed for a period of 20 years or more and highly specialized in their trades. In contrast to this, the typical TVC worker had been employed for a much shorter period and is generally not loyal to the company. He was subjected to periodical shifts of the workplace as the company needed to be flexible to cater for the various demands of their OEM customers. For the Japanese workers, the excursions to Taiwan provided one of the few occasions during their lifetime to

experience first-hand manufacturing operations outside of Japan. By combination of the knowledge gained in Taiwan with their Japanese manufacturing background, they could then later upon return to Japan propose several modifications to the work organization within the manufacturing facilities. This new knowledge helped to streamline remaining manufacturing operations in Japan.

A typical Japanese worker involved in the training would consider his assignment to be completed, once his Taiwanese counterpart produces a series of flawlessly assembled and perfectly functional valves. Before this level of perfection is reached, he would not consider a project step completed, and thus not be allowed to start with subsequent steps. When trained Taiwanese workers were then exchanged on the production lines during the project implementation, it was very much against his own beliefs, as he would never have considered transferring manufacturing knowledge to an organization, but to an individual. For everyone knowledgeable about Japanese culture, this is self-understood; in many cases knowledge or skills are taught from father to son, from older to younger workers, down the steps of group hierarchies from top to bottom. Transfer of knowledge takes considerable time and is mainly conducted by personal experience on-site, rather than by reading or accessing explicit knowledge available outside of one's own group. Even if one skill can be learned to a level of almost perfection within a short time-frame, it is often required to acquire full perfection within double or triple the time before the group allows the individual to utilize his newly acquired skills for its own or the group benefits.

Naturally the demand of KTM to reach perfection led to considerable delays in the project schedule. It was the task of the local business units' leader to balance the requirements coming out from different organizational cultures against each other, to satisfy the parties involved, and communicate these decisions in applicable languages. Moreover, all decisions reached on the level of the local unit business leaders meetings could be overridden by TFCA. The TFCA focus was almost completely on timely project execution in order to reap the benefits of manufacturing cost reduction in terms of improved profitability. Although the original project time schedule could not be met, most products started production in 2003. By 2005 all scheduled products were shifted from KTM to TVC and all necessary parts for production could be procured locally in Taiwan. The manufacturing was gradually increased at TVC, first due to the wider product variations but mainly due to increased sales by KTM. The success of this project resulted in other

manufacturing reallocation projects, 15 in total, between KTM, TVC, and later TFC China.

While the original focus of this cooperation was on manufacturing reallocation and the relevant knowledge transfer, the side-effects of new knowledge creation by communication of both cooperation partners and its combination and interpretation within their environment brought added value to both manufacturing operations.

DISCUSSION

Cultural influence on international knowledge transfer

Today the task of managing knowledge across national and organizational borders had become an almost daily exercise of globally operating organizations. In the described case, we have observed differences in the preferred methodology of knowledge transfer by the parties involved in the project; ranging from differences in national cultures, to organizational cultures to the languages used in business transactions. These differences became even more prominent, as three different organizations as well as business units from three different countries were involved in the execution: The Anglo-American management of TFC's regional Asian unit in Singapore (TFCA), an organization with a shallow history, newly created to manage and control the various acquisitions of Tyco in Asia; the Japanese organization of KTM with its rich background in technical matters, so far operating within the cocoon of its Japanese environment and heavily influenced by the long time span of traditional family ownership, and the cost-minded TVC Taiwanese management, working within the cultural boundaries of greater China and traditional Chinese trading concepts always exposed to the demands of international customers.

As the project goals and schedules were decided top-down by the Anglo-American management with heavy emphasis on timely execution, it was self-understood for the controlling unit that the same ideas were either shared by the Japanese and Taiwanese business units or, if not, that these viewpoints needed to be corrected to match their understanding. A headquarter commissioned and regionally executed knowledge management strategy was applied. In such a strategy, the headquarter sets out broad guidelines and policies and initiates the knowledge management dialog, while the regional centers take command of actual execution (Desouza and Evaristo, 2003: 64). However, the broad guidelines and policies provided for

the project framework, did not leave enough space for regional adaptations beyond Anglo-American management priorities.

Whereas the details of technical knowledge transfer were left within the responsibility of the regional business units (KTM and TVC), the setting of time and cost targets without appropriate representation of quality targets and the regionally preferred methods to achieve them, led to delays in project execution and the requirement of additional organizational resources to overcome these obstacles. We can see clear evidence in this case of the influence of multiple cultures in the implementation of management strategies.

According to Hansen and Nohria (2004: 22), the ways for MNCs to compete successfully by exploiting scale and scope economies or by taking advantage of imperfections in the world's goods, labor, and capital markets are no longer profitable as they once were, and as a result, 'the new economies of scope are based on the ability of business units, subsidiaries, and functional departments within the company to collaborate successfully by sharing knowledge and jointly developing new products and services'. Our case seems to underscore this statement as it shows that KTM sought Taiwanese sourcing for cost reasons but could not achieve a satisfactory level of quality at first. However, learning to efficiently transfer both tacit and explicit knowledge from Japan to Taiwan and later even benefit from the newly combined and created knowledge there, finally led to real improvements in efficiency and cost. Therefore, the project provides an interesting case as from the beginning it was understood to all parties involved that due to the nature of the products and its manufacturing process, it would be required to transfer codified as well as tacit knowledge from KTM in Japan to TVC in Taiwan. However, the bi-directional flow of knowledge and the subsequent creation of new knowledge on both sides of the project partners were not understood right away but rather learned in the course of the project. In further projects, the targets should include such spin-offs or side-effects of knowledge transfer and new knowledge creation

to be systematically transferred back into the loop of manufacturing operations for current product ranges that are not included in the intended product scope *per se*.

As mentioned above, by looking at the transfer from acquiring firm to acquired firm—or in a sense, between two acquired firms—our case provided a case completely neglected in the extant literature. The reason for TFC to acquire TVC in Taiwan was not to access or acquire new knowledge but simply to reduce production costs. However, to achieve that goal, KTM had to transfer essential knowledge from Japan to the new unit in Taiwan (process (1) in Exhibit 3). Subsequently, through face-to-face communication and direct interaction on the job, inter-organizational learning and knowledge creation (co-creation) evolved (process (2) in Exhibit 3). Finally, the newly (co)created knowledge is fed back from TVC in Taiwan to TFC and KTM in Japan (process (3) in Exhibit 3). This means that even in the case of an initially not knowledge-based acquisition, new knowledge creation may well happen and the acquisition might turn into a knowledge-based one in the end. Moreover, our case was particular given the fact that both KTM and TVC were acquired by TFC shortly one after the other.

In summary, the knowledge transfer could not be limited to the 're-codification of knowledge' such as the transfer of drawings, but in addition every further step in the production process had to be managed and coordinated in interaction between KTM and TVC. Hereby new knowledge was created to be brought back to Japan and to be discussed between KTM Engineering and their Japanese sub-suppliers which despite the manufacturing shift of one product range were still supplying KTM with parts of similar specifications for other product ranges. The knowledge of Taiwanese production methods was disseminated in Japan to these suppliers and provided the basis to integrate Taiwanese production cost know-how into the environment of quality-focused manufacturing. The knowledge transfer can be facilitated with the help of codified material, such as assembly descriptions, checklists, and photos of the assembly process itself; however,

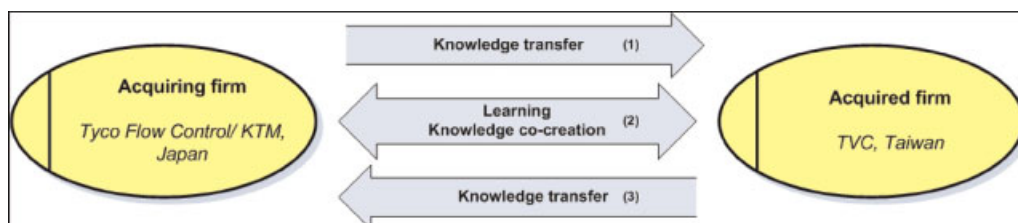


Exhibit 3 Processes of knowledge transfer and inter-organizational learning in TFC in Japan and Taiwan. Copyright Florian Kohlbacher, 2006

just by the conduct of the work over a longer period the tacit knowledge to assemble valves is transferred to the individual with the required quality level.

A further point of interest is that within the organization of a MNC, cooperation partners cannot be freely selected based on their abilities to achieve the required project targets within the project time schedule. The selection is naturally limited to the organizational units available within the MNC unless alternatively the decision to outsource is made. The selection process is generally executed on a higher management level, which provides the initial general framework for the project, taking often not into account the motivational stance and absorptive capacity, cultural differences, psychic distances, or mutual trust on both sides. The cross-cultural influences in our case manifested themselves mainly in language barriers, differing conceptions of quality, and prioritization of cost reduction. Although this might not necessarily lead to failure of the complete project, it might be responsible for delays in the execution of the project and requires additional management resources to create an open and trustful atmosphere between both parties. This is strongly in accordance with Bresman *et al.*'s (1999: 442) finding from their study of knowledge transfer in international acquisitions: 'individuals will only participate willingly in knowledge exchange once they share a sense of identity or belonging with their colleagues' and the transfer of technological know-how is facilitated by communication, visits, and meetings, and by time elapsed since acquisition. As Schweiger and Goulet (2005: 479) argue, '[c]ultural learning in acquisitions may therefore represent a pivotal mechanism for developing shared understandings and constructive employee perceptions and attitudes that facilitate integration'. But obviously, achieving cultural learning is not an easy task. That is also why Birkinshaw (1999) has found that especially core knowledge workers need to be integrated very carefully into a merged organization (cf. also Birkinshaw *et al.*, 2000).

Furthermore, one of the four barriers to interunit collaboration in MNCs—inability to work together and transfer knowledge—identified by Hansen and Nohria (2004: 26–27) was applicable for the initial phase depicted in our case, as it shows that it seems to be true that 'sometimes people are willing to work together but can't easily transfer what they know to others because of the "stranger" problem' and that 'transferring tacit or specific knowledge is likely to be more cumbersome, take longer, and thus be more costly than transferring explicit or general knowledge'. Besides, with every transfer of knowl-

edge, also a transfer of power takes place, as the commonplace 'knowledge is power' (*Ipsa Scientia Potestas Est*) by Francis Bacon in 1597 describes. If the balance of power between two partners is significantly shifted to one side due to the anticipated results of a knowledge transfer project, one cannot possibly expect the other (losing) side to act with trust and high motivational stance. From a management perspective, the transfer of production from one site to another within the responsibility of a regional manager will not affect the organizational balance of power—from his viewpoint. This is commonly described as 'right pocket–left pocket', meaning that advantages are shifted within the same sphere of responsibility without negatively affecting the consolidated sum. However, from a viewpoint of a middle manager working in manufacturing operations at KTM in our case study, the proposed shift of production to Taiwan might lead to the impression, rightly or wrongly, that his job and therefore his personal security is at stake. One cannot possibly assume effective cooperation and high motivation without outlining the (positive) consequence of the project for its own existence. Yet, the above mentioned problems can be alleviated if the two parties to a transfer have developed a strong professional relationship, a phenomenon we have also observed with KTM and TVC. In the end they had developed a shared communication frame in which each party understands how the other uses subtle phrases and explains difficult concepts (Hansen and Nohria, 2004). We therefore concur with Weir and Hutchings' (2005: 97) conclusion that 'international managers should recognize that there is no world of knowledge outside of the structures of social relations in which they are implicated, and that this can differ quite dramatically from one cultural context to the other'.

However, it would be wrong to assume that the management decisions in this case were solely based on logical, technical arguments exchanged between engineers from both sides as the project has to be seen as embedded in the organizational context of the MNC, involving not only engineers from both sides but also their commercial and organizational oriented managements. Thus the selected strategy is not only influenced by the goals of cost reduction and restructuring, but also by the available organizational and technical knowledge within different units of TFC and the judgment, which and whose knowledge can be transferred from Japan to other organizations within this MNC. The judgment was based on the technical abilities of both sides to communicate and implement the valve manufacturing knowledge rather than on the motivational disposition of both sides to openly

transfer, receive, and share such knowledge or cultural differences between both parties. This shows that a high motivational disposition is not a necessary condition for successful knowledge transfer, even though it might be a sufficient one in other cases.

As the project is considered a successful one by all parties involved, it provided the template for all further manufacturing projects within Asia for TFC and was used widely as best demonstrated practice within the global TFC organization. As such, the new knowledge created was not limited only to product-related issues and manufacturing in particular, but also to the process of knowledge creation management itself. Despite differences during the starting phase, the cooperation partners learned to accept their different cultures, expectations, methods, and management styles and thereby created the platform for further projects of similar nature. It is to be assumed that further projects between the three partners will be conducted with less teething problems and greater speed.

Lessons learned from Tyco Flow Control: Practical implications

In this section, we will briefly summarize the main points and practical implications of our case study for managers and international businesses.

In accordance with its target to reduce manufacturing unit cost while keeping product quality at an acceptable level, TFC wanted to shift valve production from Japan to Taiwan within a short time, a minimum of capital investment and only with available resources. However, the magnitude of knowledge transfer required in order to start manufacturing was underestimated and the motivational stance of the cooperation partners was negative towards collaboration at first.

The project was divided into three steps to efficiently manage the knowledge transfer: (1) codification and re-codification of engineering documents between the engineering departments of both partners; (2) selection of sub-suppliers and knowledge transfer outside of the MNC between Taiwanese engineering and Japanese quality engineers; (3) tacit assembly knowledge transfer between Taiwanese and Japanese workforce. Each step required the presence of different partners (Engineering–Engineering; Engineering–Quality Engineering; Workers–Workers) and vehicles or opportunities to transfer this knowledge (documents, dispatch to site, dinner socialization). However, difficulties arose due to the different focus in

engineering: on quality in Japan, on cost in Taiwan. Interestingly, as an unexpected side-effect, new knowledge was created that was used in Japan and Taiwan for manufacturing of other product ranges.

The three steps above provide a template for the manufacturing transfer of completely engineered products to LCCs, not only for valve products. Steps have to be conducted in series one by one and not in parallel. Emphasis has to be made on the provision of appropriate resources, namely manpower of engineering and work force to be dispatched to site and general socialization. A platform for open discussion between staff of technical background needs to be provided, free of management influence based on ‘political issues’.

Cultural differences and methods to mediate and manage their consequences have played a crucial part in the knowledge transfer project implementation. Even when providing only a project framework and defining goals and leaving detailed execution to local subsidiaries, different expectations about ‘the goal’ and ‘the way’ need to be considered when managing knowledge transfer projects across cultural borders. Insofar it would be advisable for TFC to implement the move from a ‘transnational’ strategy (Bartlett and Ghoshal, 2002), or headquarter commissioned and regionally executed to a regionally executed and locally commissioned strategy (Desouza and Evaristo, 2003) for their future global knowledge transfer projects to shorten lead-times, and increase organizational efficiencies, even if the created knowledge will not become available globally.

CONCLUSION

Finally, we want to emphasize once more the importance of global knowledge creation and that it needs time and commitment as well as an enabling context to be successful. Even though management emphasis might be shifting to a focus on the achievement of overall short-term operational targets, the long-term gains of creating new knowledge and sharing it as well as of fostering organizational learning should not be neglected or forgotten. Such a ‘knowledge management myopia’ could have disastrous effects on a firm’s competitive advantage and future survival in a global economy. Therefore, we cannot but assent to Desouza and Evaristo’s (2003: 66) pronouncement to the effect that ‘[m]anagers and executives must strive towards meeting the slogan, ‘think globally, and act locally’ to be truly successful in managing knowledge across borders’.

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