

Model of the Knowledge Value Chain in Strategic Alliances: Conditions of the Knowledge Flow between Companies

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Abstract: The purpose of this article is to provide a complementary approach of knowledge value chain management and the organizational chain of knowledge within strategic alliances. This paper explains a synthetic approach to integrated models of the knowledge value chain in strategic alliances. It combines the knowledge value chain, an enterprise value chain, and a knowledge chain. There is a large body of literature focusing on the crucial role and importance of knowledge management and the issue of its transfer between companies in the effective management. However, publications showing the model of knowledge transfer within cooperation, as well as focusing on the determinants of efficient flow of knowledge are rare. This article presents the characteristics of key aspects of knowledge management in a strategic alliance in the context of value chains of partner companies, as well as knowledge chains and knowledge value chains. On the basis of data retrieved from various sources, a model of knowledge transfer between companies in strategic alliance is proposed. An important finding is that integration of the value chain, knowledge chains and knowledge value chains of enterprises increase the efficiency of knowledge transfer. Moreover, key factors that determine the companies mutual learning process in alliances have been identified. The approach proposed is potentially an effective strategic method for creating superior value and knowledge-based competitive advantage in alliances.

Keywords: strategic alliance, knowledge transfer, inter-partner learning, knowledge value chain

I. INTRODUCTION

Strategic alliances are perceived universally as strategies formulated and carried out together by enterprises in order to achieve bilateral objectives and develop their own resources, as well as those which were produced as part of the alliance. From this point of view, strategic alliances can be treated as one of the effective ways to develop knowledge-based resources that are a crucial source of competitive advantage. It results from a strategic orientation to knowledge management. In fact, the knowledge value chain (KVC) and the organizational chain of knowledge (knowledge

chain - KC) can assist an organization to better manage its knowledge resources, from which the company creates value and competitive advantage (Najmaei and Sadeghinejad, 2009). Neither of the approaches (KVC and KC) is common in knowledge management literature, creating a conceptual gap.

Contemporary conditions for competition determined by phenomena associated with the processes of globalization, liberalization of social and economic life, the internalisation of operations of companies, or the Internet revolution, pose new competitive challenges for businesses. One way to gain new sources of com-

petitive advantage and enhance sustainable competitive advantage is making an alliance with another company (including the competitor) and searching for key competencies and knowledge-based resources. Literature pays considerable attention to the importance of knowledge resources in the creation and development of strategic alliances (Connel and Voola, 2007).

Dealing with competitive challenges through strategic cooperation is not a simple task that can be easily planned and implemented. Therefore, the issue of the functioning of strategic alliances should be examined from the perspective of sources of competitive advantage of alliances under the conditions of the contemporary knowledge-based economy. Most studies in the field of strategic alliances rely on the basic concepts of the value chain and competitive knowledge, and links these issues have with other new issues in the discipline of knowledge management. It is widely recognized that integrating the fields of knowledge management and strategic management is possible. As a result, the range of competitiveness conceptualization based on the value of knowledge has increased. This perspective synthesizes the competitive capabilities of alliances with the techniques of knowledge management (Najmaei and Sadeghinejad, 2009).

2. KNOWLEDGE VALUE CHAIN MANAGEMENT IN STRATEGIC ALLIANCES

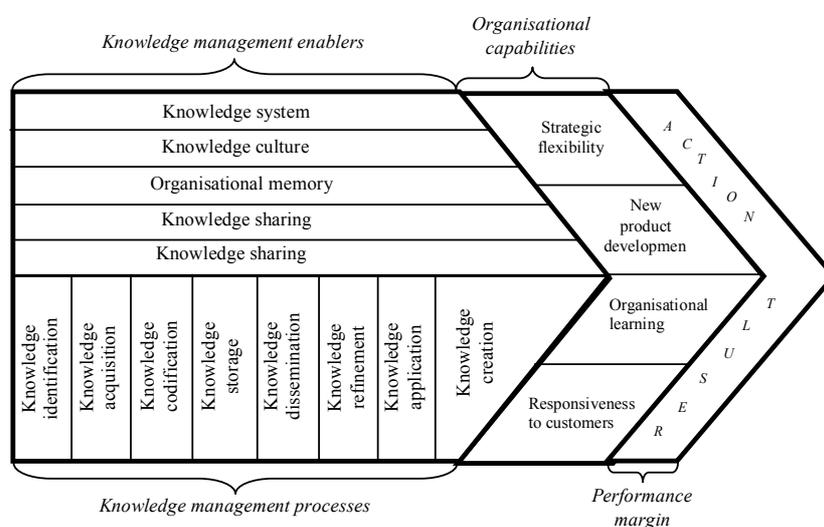
The level of competitiveness of the knowledge-based economy is determined by intangible competencies and skills, which generally are built on the basis of

potential knowledge. These resources can be divided into three groups: specific skills (key differentiation factors that are difficult to duplicate), key competencies (which are competitively necessary), and routine competence (preventive measures to stay in the market game) (Eustace, 2003; Lee and Yang, 2000).

Key skills and competencies of an enterprise are the basis of its value chain and can be effectively developed through participation in a strategic alliance with the use of the knowledge value chain. It is identified as a causal link between knowledge management initiatives and the results of operations, enabling the development of core and distinctive competencies to enhance the ability to compete. The chain of knowledge is defined as the ability to recognize, predict and act on the market based on a four-part model consisting of an inner consciousness, internal reactions, the external trigger, and external consciousness. These activities integrate internal resources with external changes, giving rise to the creation of knowledge-based competitiveness, because this knowledge can be translated into a resource that is high flexibility. The chain of knowledge must be included in the formulation of strategies and must be integrated with the value chain model (Carlucci, Marr and Schiuma, 2004; Spinello, 1998).

The use of the knowledge value chain model in the operation of strategic alliances can help to strengthen the agreement and improve knowledge transfer. Knowledge value chain model (see Figure 1) is analyzed on the basis of knowledge management processes (identification, acquisition, codification, storage, dissemination, improvement, application, and

Figure 1. Knowledge Value Chain



Source: Wang and Ahmed, 2005, p. 323.

knowledge creation), as well as areas of knowledge management (system of knowledge, knowledge culture, organizational memory, and sharing and imitation of knowledge) (Wang and Ahmed, 2005).

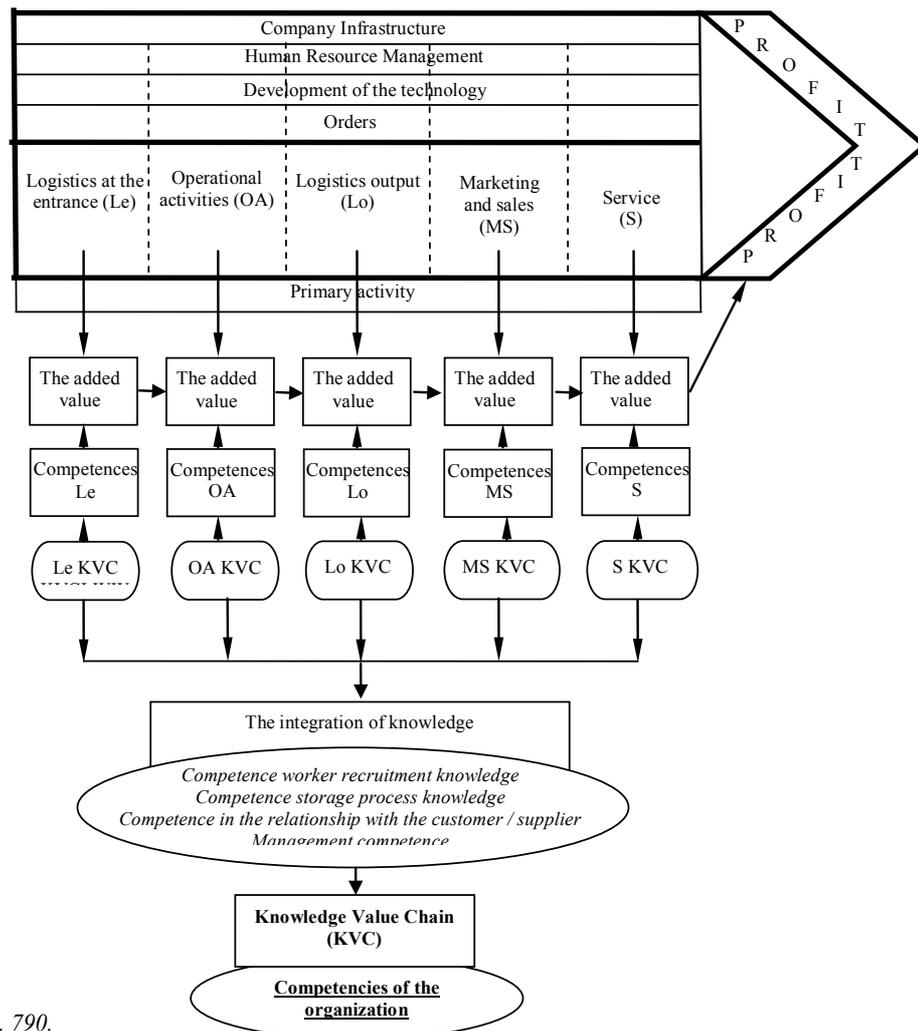
Knowledge management increases the flexibility of strategic management, and a knowledge management system functions in the form of a chain of knowledge enabling the company to run smoothly. From the point of view of the management of knowledge value chains, strategic alliances need to be carefully managed, and require a common structure, culture and management systems. Another model of knowledge value chain focuses on three of its major links: knowledge creation, dissemination, and implementation, which may lead to more favorable results. At the same time, a knowledge chain defined in such a way describes the relationship

between the company's value chain and its components (cells) more precisely. The relationships between the company value chain, the knowledge chain, and the knowledge value chain are presented in Figure 2.

This model can also be associated with the knowledge value chain model described previously (see Figure 1), particularly in the context of creating competitive advantages within the framework of making strategic alliances. Therefore, the conceptualization of the knowledge chain and the knowledge value chain is suitable for the development of alliances aimed at creating intangible competencies and competitive capabilities in a variety value chain cells of partner companies.

Strategic alliances must be equipped with knowledge chains, which should be matched carefully. Companies who are strategic allies must strive to

Figure 2. The Relationship between Organizational Value Chain, the Knowledge Chain and the Knowledge Value Chain



Source: Lee and Yang, 2000, p. 790.

make full use of the knowledge value chain elements in order to strengthen cooperation and quickly achieve bilateral competitive capabilities. In addition, the knowledge value chain facilitates knowledge transfer and sharing of knowledge, which helps to improve the relationship between the alliance partners (Najmaei and Sadeghinejad, 2009).

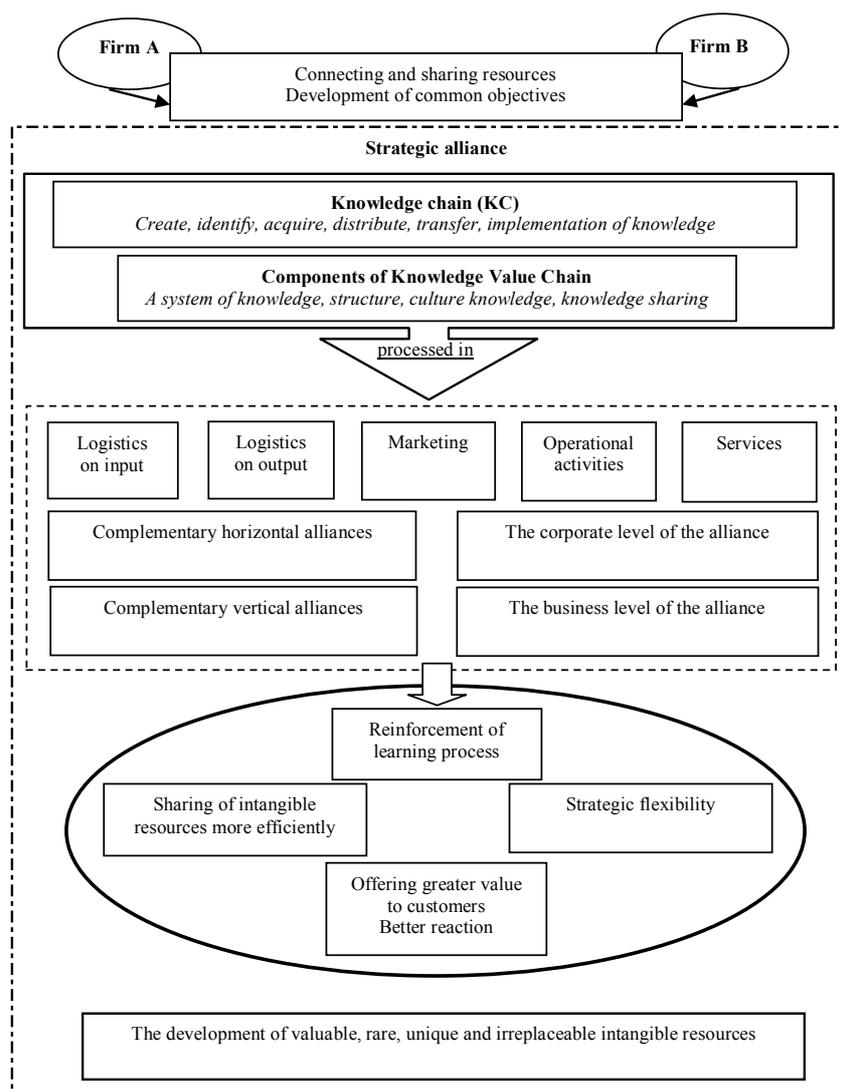
3. INTEGRATION MODEL OF THE KNOWLEDGE VALUE CHAIN, THE KNOWLEDGE CHAIN, AND THE VALUE CHAIN FOR ENTERPRISES

One of the main objectives of planning strategic alliances and the management of such alliances is to share organizational resources, especially those based

on knowledge. These resources allow companies to create common, more advanced competencies that are valuable, rare and unique. Therefore, strategic alliances are intended to create cumulative and bilateral value that exceeds the value created by each of the partners individually. At the same time, creating these basic and indigenous skills (key resources) requires a comprehensive alliance management mechanism on the basis of the value chains of the allies.

The knowledge chain characterized previously as a process of knowledge creation, dissemination, transfer, and implementation of knowledge in an alliance must be properly planned, formulated, implemented and managed by various organizational activities based on the knowledge value chain. It includes - in addition to the basic functions of organizational knowledge

Figure 3. The Integrated Model of the Knowledge Value Chain in the Context of a Strategic Alliance



Source: Najmaei and Sadeghinejad, 2009, p. 306.

management – knowledge of the enterprises, to include such issues as the organizational cultures, their organizational structures, and technical infrastructure. Thus, the knowledge chain is included in the knowledge value chain. This approach is a strategic way to create superior value and a knowledge-based competitive advantage derived from the alliance (Najmaei and Sadeghinejad, 2009).

Figure 3 presents a synthetic and integrated model of the knowledge value chain in a strategic alliance. It combines the knowledge value chain, the value chains of enterprises, and the knowledge chain. At the same time, the model indicates effective methods for achieving the results of cooperation, involving a high degree of synergy, and from this point of view, the model can serve as a strategically valuable approach for the creation and operation of strategic alliances. Conceptualization of the model gives rise to a search for sources of competitive advantage based on knowledge in terms of the knowledge-based economy.

4. DETERMINANTS OF EFFICIENT FLOW OF KNOWLEDGE BETWEEN COMPANIES IN A STRATEGIC ALLIANCE

Three main areas could be pointed out that determine the efficient flow of knowledge between partners and determine effective management of knowledge transfer in a strategic alliance (Chung-Jen, 2004):

Attributes of knowledge can be reduced to the distinction between explicit and tacit knowledge. This is based on the determination of whether knowledge can be codified, passed from one person to another, presented verbally, or systematically documented and recorded. Tacit knowledge is personal, often referring to the context of the situation in which it is used. This knowledge can present problems of communication difficulty in formal communication. By contrast, explicit knowledge is transferred in a formal and systematic way. The effectiveness of knowledge transfer may be affected by attributes of knowledge. For example, a strategic agreement regarding the transfer of technology aimed at the exchange of tacit knowledge and experience (competencies and skills) is more likely to end in failure than those relating to the formal exchange of technological ideas. This is due to the fact that an attribute of knowledge related to the production process or technology is hidden (implicit) in character; therefore, its transfer between employees or cooperating companies is extremely difficult. The

extent to which the capabilities and capacities are codified and formally registered has a significant effect on the rate of transfer of this knowledge. Explicit knowledge is easy to gain from an alliance and can possibly be quickly learned and used, as it can be communicated in a formal and systematic way. On the other hand, tacit knowledge is mainly personal and contextual; hence it is difficult to formalize and communicate. Therefore, partner companies should take more effort and time to transfer tacit knowledge (hidden, undisclosed).

Features of the alliance specify, inter alia, the form of the agreement, the scope of implementation, the main objectives, and other key characteristics. Alliance features also determine the speed and efficiency of the knowledge flow between the cooperating companies. Both, in the case of capital relations (joint venture, joint investments, capital ties), and agreements based on contractual partnerships (licenses, agreements on cooperation in the field of R&D, marketing, and production): the selected form of cooperation directly affects the outcome of the alliance and possibilities to achieve the objectives of each party of the agreement. It can be concluded that capital agreements tend to stabilize and persist for a longer period of time due to the large commitment of capital and resources of allies. This reduces opportunistic behavior of particular partners, and also creates higher costs for leaving the alliance. For this reason, this type of agreement can be seen as providing more effectiveness in discovering and learning new knowledge, because the participants can actively engage allies in sharing competencies and maintaining cooperation and commitment, all of which promotes better interaction. Generally, capital cooperation agreements can lead to better knowledge transfer between partners, although they are more expensive. This kind of cooperation means a partial loss of autonomy, closer interaction with the alliance partner, and requires a greater commitment of resources or takes a larger investment risk. Therefore, before making a decision about the conclusion of such an agreement managers should consider whether it is necessary to cooperate in this form.

It should also be noted that different forms of alliance may be suitable for different knowledge transfers. Capital alliances are more adequate for the transfer of tacit knowledge, while technological contracts are suitable for explicit knowledge transfer and the transfer of personnel includes the articulation of tacit knowledge. Effective long-term technological transaction agreements are more likely when the technology (which is the subject of the agreement or contract) is unique, and

knowledge is more clear and formally specified. Closer interaction bonds implied by the capital agreement are suited for the transfer of tacit knowledge (transfer of such knowledge will be more difficult in the case of long-term free cooperation agreements). Therefore, the companies whose aim is to exchange knowledge of this type should consider capital agreements, e.g. joint ventures. On the other hand, the nature of formal and codified explicit knowledge promotes ease of transmission, and therefore needs less communication tools in the process of its transfer. Thus, equity contracts that allow closer interaction between firms are less effective in relation to the transfer of explicit knowledge. Alliances based on loose cooperation agreements will be more suited to acquiring this type of knowledge.

Knowledge absorption skills refer to the company's ability to absorb and replicate new knowledge from external sources. These skills are the result of a long process of knowledge and investment accumulation in the company. Therefore, sustainable development of the ability to absorb knowledge in a company is a prerequisite for the effective use of knowledge in the environment. A higher level of absorptive capacity can contribute to improving the company's ability to use external sources of knowledge (especially technical and specialist). Companies with a high level of absorption capacity can better identify the applicability of new knowledge acquired from other companies and use it in the development of innovative operation of strategic partners and the entire alliance. Acquisition of knowledge from external sources and organizational learning skills are difficult or even impossible without such absorption capacity of the company.

A variety of factors have an impact on the ability of a company to absorb knowledge: organizational, technological, and human resources. What should be pointed to, among others, is the importance of organizational culture, technological and capital capacity of enterprises declaring their willingness to cooperate, trust, and the significance of structural, strategic and cultural adjustment of partners. Enterprises seeking to gain knowledge and learn from others using strategic alliance, must recognize that mutual trust is the basis for cooperation. Opportunistic behavior and inflexibility often leads to failure of the alliance. Therefore, companies should first precisely perform the procedure of selection of alliance partners, and then act fairly towards them during the implementation of the objectives of the agreement. Companies are more likely to acquire knowledge from outside if they have better ability to absorb knowledge. If companies are trying to gain knowledge from their partners in the framework

of cooperation or an agreed framework, they should communicate with each other without problems and assimilate new knowledge more effectively. Partner companies need to constantly seek ways of improving upon the initially defined scope of work.

In the context of alliance management, the learning process between partners concerns the extent to which companies will form a regular and repetitive pattern of procedures to promote the transfer of knowledge. The exchange of knowledge and information becomes easier the longer the agreement unfolds and the acquisition of knowledge about the partner and a reciprocal or complementary learning process supports the knowledge and information transfer, and contributes to improving the management of the alliance. As firms learn about their alliance partners, they learn how to interface and communicate with them. This type of learning involves the process rather than the content of learning (that is, inter-learning), which allows partners to revisit and revise their expectations of one another, and to gain a deeper understanding of their counterparts. There are three reasons supporting the claim that inter-partner learning fosters alliance success (Tjemkes, Vos and Burgers, 2012):

- **relationship openness** is supported by inter-partner learning, and is the extent to which firms are willing to share information more openly. Extensive communication contributes to meaningful and timely information sharing. Increased openness also helps partners to work together more efficiently, increases awareness of their particular interests, and encourages alliance management;
- **transfer of tactic knowledge** is predicated on inter-partner learning, which in turn motivates parties to participate and openly share valuable knowledge. It reduces the difficulties implicit in the transfer of tactic knowledge. Moreover, it helps firms to acquire individual viewpoints and to develop a common language to teach how to make the alliance work;
- **reduced risk of exchange hazards** is defined as a decrease in the likelihood of opportunistic behavior, conflicts of objectives, free-riding behavior, instances of appropriation, and spill-over concerns. Informal feedback mechanisms provide firms with signals about one another's conduct. It also allows to openly share strategic intents, resources and knowledge of alliance partners.

The organizational learning process through the exchange and transfer of knowledge within the framework of strategic alliances can be analyzed at four levels, including the different motivations of partner

Table 1. Key Aspects of the Companies' Mutual Learning Process in the Alliance

Specification	Description
1. Competitive cooperation	<p>a) some companies may consider the internalisation of rare skills as a primary benefit of international cooperation;</p> <p>b) where acquisition of knowledge and the organizational learning process are seen as a goal, then the termination of cooperation should not be seen as failure; the same length and the stabilization of the alliance can't be unambiguously considered as a success;</p> <p>c) asymmetry in the learning process leads to the change in the relative competitive position and advantage of allies already outside the structure of the alliance; therefore, some companies may themselves be seen both as competitors and allies.</p>
2. Knowledge and bargaining power of the partners	<p>a) asymmetry in the learning process causes a change in bargaining power within the alliance: successful learning can result in „the limitation period” of the original contract and, in extreme cases, can lead to patterns of unilateral rather than bilateral partner dependence;</p> <p>b) formal structure may only have a marginal impact on the patterns of inter-partner learning process and the negotiating bargaining power of the firms;</p> <p>c) the company, which is aware of the existence of the relationship between the exchange of knowledge (inter-partner learning), bargaining power in the process of „transaction of knowledge” and the competitiveness will perceive the alliance as a race to knowledge.</p>
3. The intentions of the partners as a condition for the exchange of knowledge	<p>a) objectives of partner companies, in terms of inter-partner learning and knowledge acquiring, may be referred to as the internalisation of activity, concentration of resources or survival;</p> <p>b) the intent of internalisation is going to be more important in the case of a company that sees competitiveness on the basis of competencies, expertise and skills rather than on the basis of the offered product, and which are looking for more opportunities to cover the lack of skills than offset the failure (loss);</p> <p>c) imperative of survival is in principle the asymmetry in the learning process.</p>
4. Transparency of the process of knowledge acquiring	<p>a) lack of clarity and transparency in the transfer of knowledge implies the asymmetry of the learning process: some of the skills can be inherently more clear than others;</p> <p>b) transparency can result from organizational design of the areas of partners' interaction, the structure of common tasks and protection of individuals.</p>
5. Availability of knowledge	<p>a) asymmetry in the availability of the partner's knowledge implies asymmetry in the learning process - in this respect, some of the companies may be more open than others;</p> <p>b) openness in terms of access to knowledge is a function of skills, capabilities and disclosure of items.</p>
6. Conditions of enhancing alliance knowledge	<p>Whether the learning process strengthens itself autonomously (i.e. whether the company can ultimately - without further input from the partner - improve, strengthen its skills at the same rate and extent as an ally), depends on the depth and scope of the process of knowledge exchange that took place in the alliance; strengthening the competence, experience and skill determines the possibilities of the future liberation from dependence on the partner, and finally determines the discipline of actions, which is necessary for further continuous improvement of the company's abilities and knowledge.</p>

Source: Drewniak, 2004, p. 230.

companies and the range of potential benefits. These are listed as follows (Contractor and Lorange, 1988; Doz, 1996; Gulati, 1999; Gupta and Mistra, 2000; Simonin, 1997):

- an ability to use the acquired knowledge in planning and management of other agreements in the future;
- the process of mutual learning, leading to the creation of joint enterprise value;
- a learning perspective together with the alliance partner, especially when the allies start a new business or acquire and develop new capabilities;
- the opportunity to learn from a partner without integration of its activities.

There are six aspects of the mutual learning process of partner companies, including their characteristics, shown in Table 1.

The learning process should not be seen as a motive for the creation of strategic alliances, but as a determinant of the alliance management process, as the acquired knowledge is crucial for the evolution of an agreement. Strategic alliances can generate knowledge that can be used by the parties of the agreement to strengthen their own strategy, not related to the areas of operation of the alliance. Competencies of the strategic alliance, formed in this way constitute an autonomous agreement value, resulting from the transfer of a partner's skills. This value can bring unilateral benefits to companies in the future. This knowledge can be used in fulfilling tasks other than those within the alliance, such as improvement of products, or to gain new markets. This resource is a value that the company would not have received without the participation in a strategic alliance.

5. CONCLUSION

Today's management environment (the progressive processes of globalization, the rapid progress of technology, an increase in the intensity of competition in all areas, the precipitous rate of shortening of product life cycles, and the accelerating changes in buyers' needs) force us to pay special attention to the learning abilities in a knowledge-based economy. These abilities are crucial determinants of the development of enterprises. Contemporary business activities are characterized by a high degree of intense competition, and having knowledge-based resources is seen as a key means of obtaining and maintaining a competitive advantage. At the same time competitive conditions

make companies act unilaterally, thus attempting to build a competitive advantage based on their own sources of knowledge. This bears a substantial risk, however, and may not achieve the desired objectives. While starting and continuing cooperation between enterprises under the strategic alliances allows and improves significantly the partners' ability to quickly acquire missing knowledge. Additionally, these alliances bring competencies and learning needed in order to strengthen their competitiveness, while benefiting the alliance as a whole. For companies, SMEs in particular, with limited financial resources, a home country focus, and a small geographic base, international activity through strategic alliances with other companies can be a significant step in their development. Most of them lack the resources required for engaging in overseas activities, and therefore cooperative activities with other companies gives firms the opportunity to acquire scarce resources (Lu and Beamish, 2001; Kirby and Kaiser, 2003). In fact, internationalization begins with exports, moving to joint ventures and licensing, and then to wholly-owned subsidiaries, potentially increasing the scope of management knowledge and investment (Pollard, 2001). SMEs can acquire these resources by cooperating with other internationalising SMEs. The partners can use their scant resources more efficiently, divide risks and costs of entry in foreign markets, share and obtain new information, and learn new skills (Nummela, 2002). On the other hand, Kirby and Kaiser (2003) opine that alliances are not without their problems. The choice of the alliance partner is critical to success and conclude that, given the limited resources of SMEs, they need assistance to enable them to select a suitable alliance partner.

The integrated knowledge value chain model presented in this paper can be used for the effective management of knowledge transfer in a strategic alliance through the integration of value chains and chains of knowledge of cooperating companies. The use of this knowledge value chain model in the operation of strategic alliances can help to strengthen the understanding of the agreement and improve the knowledge transfer. Companies must also know which knowledge is desirable, identify what should be protected, implement the critical success factors of the knowledge transfer, and understand how these factors influence the effectiveness of knowledge transfer in the alliance. It seems that successful networks of alliances are an exemplification of successful knowledge transfer. Knowledge-based alliance networks constitute a subject requiring more in-depth research in the future.

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