

An Integrative Knowledge Management Approach to Sustainable Competitive Advantage

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Abstract

This paper presents an integrated model establishing a connection between knowledge management activities and Sustainable Competitive Advantages (SCA), developed within the VRIO (Resources Value, Rarity, Imitability and Organizational capability) framework. The model presents four groups of attributes, in concentric circles: in the center, the goal, (SCA); in the second circle, the learning scenarios and competitive intelligence activities, guaranteeing the presence of the dynamic aspects of organizations; then, activities focusing on the creation of resources and competencies, as well as activities protecting these sources of value with attributes like rareness, inherent replicability, imitability and complementariness, like best practices and yellow pages; in the outer circle, concerns with culture, information technology, managerial systems and organization design.

As it has been fully discussed and studied in recent literature, the organizations and economies, as living organisms, evolve in response to challenges and opportunities they face. This changes can be rather radical.

During the 80's decade, several researchers in the world identified the passage from an industrial society to a knowledge society. In fact, at that point, this "visionaries" were identifying not a trend, but a reality. The 90's showed that the world was passing through a social and economical transformation even more radical towards a knowledge economy. The knowledge has been, in course of history, a source as important to organizations and nations success as any other traditional resource, like land, capital or labor. The employees know-how has always been considered an important asset (Cole, 1998).

Nonetheless, a fundamental change is occurring in the composition of this elements. Since the beginning of the century knowledge has become increasingly important as a element of wealth creation, and several economic studies show changes in the composition of global economy elements in a way to valorize intangible assets, as is widely accepted.

These changes have not occurred by chance. American economy mainly and, given the current globalization, world economy, have ingredients, in this start of a new century, for a wave of innovation with no precedents in humankind history.

The new economy, leveraged by information technology and driven by technological progress as a whole, has condition to sustain a crescent innovation process. With the advent of the internet, extranets and others technologies, the information revolution seems to be disseminating and accelerating instead of reducing its rhythm.

The economy transformation hits practically every sector, like industrial, financial services, universities and even governmental institutions reinvent themselves to adapt to a new reality.

Knowledge management

Sveiby (1998), writing about the new organizations does an excellent comparison between a knowledge era enterprise and one inserted in the industrial paradigm.

Sveiby also writes that when a company value in the stock market is worth twice, five or ten times its book value, we can say that the market is indeed considering the intangible

assets of it. These can be the relationships with clients, its brands, the competence and knowledge of their employees and the characteristics of its organization structure that contribute to the maximal creation and use of knowledge in it conceived. Therefore, the main value of modern enterprises is not in their physical capital but in its talents, competencies and ideas, or so, its intellectual capital. No investor buys Microsoft or Intel stocks due to its factory or equipment that they own, but for their capabilities to generate new ideas, skills and innovations able to generate wealth (Stewart, 1998), and this will be rule in the new economy.

With the growing interest in intellectual capital, several definition can be found in the available literature. Many of these are vague when searching a foundation for practical actions in organizations, as in “the knowledge and know-how accumulated by individual”. A first definition with practical aspects was made by David Klein and Larry Prusak: “intellectual material that has been formalized, captured and leveraged in order to produce a higher value asset (Ernst & Young Center for Business Innovation, 1994). This definition has several positive points. The differentiation between intellectual material and capital is one of them, once it allow us not to consider information like an address as part of an organization intellectual capital. Besides, that also allows to infer that intellectual assets can be found in different places.

In a way to make easier to study and to identify the different kinds of intellectual capital, several authors identified possible places where it could be found. The most accepted currently is the composition suggested by Hubert Saint-Onge and Leif Edvinsson (Edvinsson, 1998), that subdivide the intellectual capital of an enterprise in clients capital, structural capital and human capital. The generation of intellectual capital is then understood as resulting from interaction among this tree factors, and not individually from each of them.

However, this view based in the concept of intellectual capital, even being the most spread, is relatively limited and slightly rigorous. Jointly to other views of equally short range, it creates a portfolio of alternatives some times even divergent, where managers and practitioners in general have to make a choice.

Under a wider perspective, we can define knowledge management in a brief way as being *a interdisciplinary approach focused on its environment, its agents, and the process of creation, mapping and transferring knowledge , with the final goal of achieving sustainable competitive advantages.*

Anyway, being knowledge so important within the economic scene, and the movement of the key-resource on the inside of the organizations from physical, labor and financial capital to capital based on knowledge assets, the management of this assets become fundamental to a company that wishes to keep competitive in the new millenium. It is a need to create, grow and manage them in a efficient way, because this knowledge possess a high added value that is ready to be applied to decisions and actions that some way will allow to increase the state of perceived value in this process, building competitive advantages.

Naturally, the other disciplines in the administration field do not loose their value. It is needed to integrate more and more the organizational knowledge. Although, nowadays, it is even more clear that knowledge management will be the most important competitive differential in the 21th century economy.

Perspectives in strategy

In general, the theories in the business strategy field concern, basically, the search for competitive advantages. Competitive advantages, on the way, imply in acquiring financial returns above the normal and are the explanation for the differences in the performance of different enterprises (Schendel, 1996).

The explanations to get results above the competitors can be then the most variable possible. According to Barnett and Burgelman (1996), “a company can obtain competitive advantages by being in a market position that is protected from its competitors (Porter, 1980), may occupy a powerful position in a network of organizations (Pfeffer e Salancik, 1978), owing a structure or strategy that fits better to market challenges (Scott, 1975), may be designed to minimize transaction costs (Williamson, 1991), or may have outwitted its rivals in strategic interaction (Dixit and Nalebuff, 1991)” among other less discussed approaches.

Notwithstanding, the 90's has seen the strength of a perspective in special, resulting from the challenges of the new knowledge economy: the resource-based theory of the firm. This perspective fulfill the lack left by the popular view of Porter, dominating during the 80's, e centered in the importance of industries and their inter-relationships, leaving the differences among individual enterprises in a second level. Moreover, academics associated to a evolutionist perspective bring to light the importance of the dynamic aspect when conceiving and, more important, implementing the strategies.

The knowledge-based theory of the firm

To many experts in strategy, the industrial economics in general and the transaction costs economics in particular, remain a unsatisfactory approach to theorize about organizations and competitive advantage. One of the weaknesses concerns its emphasis in static's comparative analysis and the identification of generalized boundary conditions between organizations and markets. Besides, the theory transaction costs is primarily concerned with transactions that involve fixed and tangible assets (Liebeskind, 1996).

In the quest to overcome these hurdles, the spectrum of problems and disciplines incorporated to strategy continues to expand, specially toward the “knowledge worker” and to “information society” (Spencer e Grant, 1996). Such change has been fast, although intelligence, information and knowledge always had had an important role, and ten years ago we almost didn't hear about terms like tacit knowledge, organizational competencies and capabilities, intangible assets and organizational learning. These concepts complement the transaction costs theory and the Porter view, analyzing the internal side of the competitive equation, dislocating the main focus of analysis to the resources an enterprise has and the way it uses them. What is noticed then, is that among the many resources that an organization has, the ones more vital for such analysis are those based on knowledge, and the theory is then understood, to practical means, as a knowledge-based theory of the firm.

The VRIO framework

As mentioned, the resource-based perspective understands these as the main (if not the only) source of competitive advantage, sustainable or not. A method to evaluate the resources and its strength as leverages of competitive advantage was described by Barney (1991), and is known as VRIO.

The VRIO framework suggests that enterprises position themselves strategically based on its singular resources and capabilities (and not in the products and services derived from them), valuable, rare and hard to imitate. Distribute this resources in several products and markets instead of specific products to specific markets become the main strategic determinants. While these can come and go, resources and capabilities are much more lasting (Zack, 1999).

We can evaluate a resource under the VRIO framework through four questions (Barney, 1996):

- The question of value: Do a firm's resources and capabilities enable the firm to respond to environmental threats or opportunities?
- The question of rareness: How many competing firms already possess particular valuable resources and capabilities?
- The question of imitability: Do firms without a resource or capability face a cost disadvantage in obtaining it compared to firms that already possess it?
- The question of organization: Is a firm organized to exploit the full competitive potential of its resources and capabilities?

The implication of this analysis to a company's competitive position can be seen in the table 1.

Table 1 : VRIO Analysis. The resource is...

Valuable?	Rare?	Costly to imitate?	Exploited by the organization?	Competitive implication	Economic performance
No	-		No	Competitive disadvantage	Bellow normal
Yes	No		↓	Competitive equality	Normal
Yes	Yes	No		Temporary competitive advantage	Above normal
Yes	Yes	Yes	Yes	Sustainable competitive advantage	Above normal

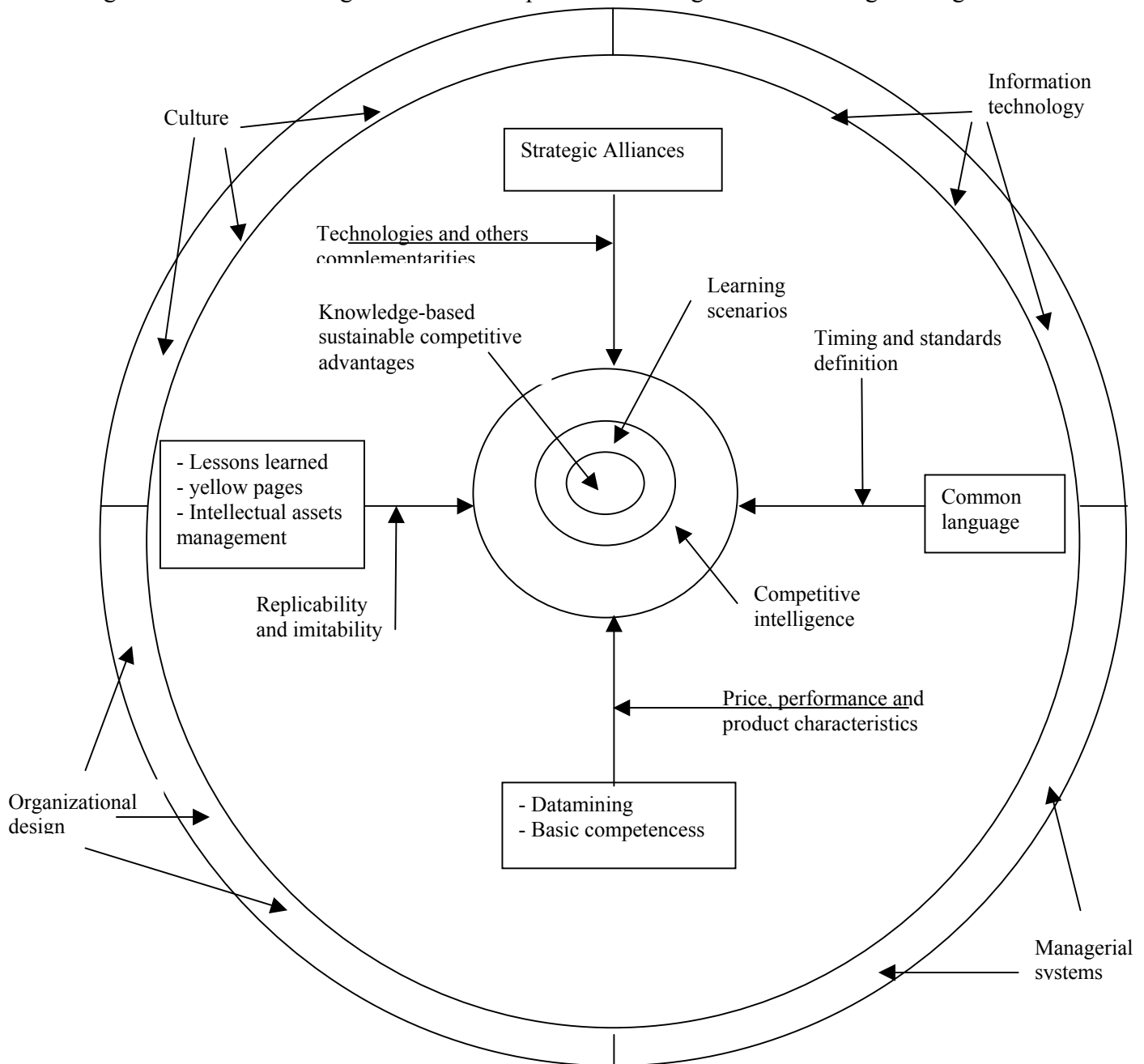
Source: Barney, 1996

A model linking sustainable competitive advantages and knowledge management

Several initiatives, some of it used to be allocated under different disciplines and some quite new, are under the knowledge management “umbrella”. One of the most known classification was made by Davenport et al. (1998), based on the project objectives: to create knowledge repositories, improve knowledge access and improve knowledge cultures and environments. However, neither this or any other classification consider strategic aspects. Trying to fulfill this space, we present the model in the figure 1, which establishes a connection between the several activities in knowledge management and the obtaining of sustainable competitive advantages based on knowledge assets and in the VRIO framework analysis (see figure 1).

The proposed model has basically four groups of attributes: at the center, the ultimate goal, competitive advantages. A concentric second stage lets the company to be aware of market signs while they are still weak and diffuse. It is composed by scenario learning and competitive intelligence activities that, together, secure that the dynamic aspect of organizations is represented in the model. The next stage presents activities responsible for the creation of resources and competencies with attributes of value, rarity, replicability and incorporated by the organization. This group and the one before, together, represent the *specific impact initiatives*. In this sense, we include diversified actions like intellectual assets

Figure 1: A model linking sustainable competitive advantages and knowledge management



Source: the author.

management, to build a common language, strategic alliances and datamining. Finally, around all the activities cited so far, there is concerns with culture, information technology, managerial systems and organizational design. When planned under knowledge management lens, these actions will have great influence over all the others and will impact in the organization as a whole. Because of that, we call this group *wide impact initiatives*. It is important to say that, naturally, many of the specific impact activities can be very

interdependent. However, under the VRIO framework they are much more restrict than the latter.

Specific Impact Initiatives

Value creation from knowledge management initiatives

The value creation activities based on knowledge are those that allow an enterprise to sell products and services with attributes that meet market needs. In this sense, some marketing activities can be put in this group. One that is normally associated with knowledge management is datamining. Despite to be a term usually used in a wrong way, datamining techniques can provide a company with precious information in regard to the market where it operates and to its clients (allowing to better fit products and services to them), derived from analysis of data the company already possess but would not have the ability to analyze normally.

Much more important to value creation is to exploit the organization basic operational competencies. As said before, to develop products from these secure a more solid and lasting base from which the company can generates a series of products and services. Examples can be easily found in the literature as, for example, the Honda motors case.

Rarity and replicability of knowledge assets

The initiatives related to rarity and replicability are responsible for the bonds that increase (or forbid) imitation costs of a company knowledge-based assets.

The easiest way, and usually the less efficient, is intellectual assets management. Still being important, the innovation speed in the current competition scenario is to high to allow patents to protect the most important assets of a company. An example of failure in this case was the attempt by England-based EMI in get into the medical equipment market selling scanners, based only in the fact it owned the patent. Even being such innovation a very important one, as it proved to be as the years passed, the protection mechanisms the company had were not enough to guarantee the market, where it had no knowledge of distribution channels or a recognized brand. Such mistake almost bankrupt the company, that loose the market to General Electric.

On the other side, companies like Dow achieved big economies not only using patents as a mean to appropriate the value of its discoveries, but by simply management them. Selling, licensing, abandoning or renewing its patents as it wishes, Dow are looking for a one hundred million dollars revenue in the years to come.

Another way of guarantee that the assets and competencies developed within a company remain replicable, that is, that this competencies can be equally used in a different unit, and at the same time hard to be copy by rivals, is to develop initiatives that create ties that accelerate the process of internal diffusion while making difficult the process of external analysis and copy. This can be done by a series of initiatives focused mainly on people. Projects involving the dissemination of best practices and lessons learned, as the developed at Ernst & Young for instance, minimize the chance that the same knowledge be created more than once within the same organization. Others examples include Sequent Computers and Buckman Laboratories.

Nevertheless, the most valuable knowledge usually is also the hardest to be articulate and, then, to be codified in a lesson learned or any other form that could travel by a digital line. Hence, a frequently forgotten but fundamental component to guarantee this initiatives is

the human contact. This can be facilitated with fairs, discussions rooms and others initiatives that assure that the employees will exchange ideas personally, as they do around a coffee table or during the lunch. There are already a lot of companies doing that, like HP, and some are even projecting new buildings to guarantee such interaction, like McKinsey and its Toronto office. This kind of personal interaction makes much harder to a competitor to identify the sources of differentiation, and copy them. Even hiring a person from this company can be of no value for the competitor if the competencies are based in the fast diffusion of the knowledge it already possess and in the generation of new insights.

Complementary activities: strategic alliances

Under uncertainty, organizations need to make a choice about where to invest, and how to invest. As taught by the transaction costs theory, not all activities are better executed when done internally. Hence, the need for complementary competencies become more imperative, specially – but not exclusively – to companies in extreme dynamic environments. The management of the needs, the establishment of the relationships and the mechanisms that guarantee the success of alliances may also be incorporated in knowledge management efforts. One sector that has been very successful with these activities is biotechnology. Interesting to notice, different companies adopt different posture in their search for inter-organizational knowledge. As a result, Amgen and Genentech have, for instance, strategies completely different to reach the same objective of supply their need of external knowledge, either from other companies or universities (Powell, 1998). In the EMI case, for example, if the company had chose a strategy of partnership with some other company already established in the sector, complementing its own competencies, it could have obtained a reasonable return over its investment.

Competitive intelligence and learning scenarios

Competitive intelligence and the use of scenarios are the kernel in the development of dynamic capabilities within an organization. This is the ability to identify and to take advantage of new opportunities (Teece, 1998) and, therefore, is in the base of the company's competitive strategy. Despite its simple definition, to develop such ability is a very demanding process, in which competitive intelligence and the use of scenarios has a major role.

We can summarize competitive intelligence as “ the planned and coordinated monitoring of competitors, no matter where they are and who they are, in a given market”. It includes determine what they will do before they do it, what is not a simply task and involves the acquisition, integration, analysis and distribution of information with the final goal of help the decision making process.

Scenarios, on their way, has been used for a long time as a planning tool, but has acquired increasing importance as a complement to traditional techniques and to help to incorporate aspects concerning the uncertainty of the modern world (Ávila, 1989). With the increasing need for them, new models has also arisen emphasizing learning aspects.

Wide impact initiatives

Technological support

Nowadays, a common phenomena in organizations is to see knowledge management initiatives as mainly technological. That is, no question, the biggest mistake a company may incur, and it is also a very costly one (Prusak, 1998). Davenport and Prusak (1998) suggest a simple rule to evaluate reasonable costs with information technology when implementing knowledge management programs. For them, these costs cannot exceed one third of the project's overall costs. O'Dell and Grayson (1997) complement saying that "more valuable the knowledge, less sophisticated the technology to support it". As said before, the more valuable knowledge is usually tacit, that has to be shared among people, needing ,therefore, less technological structure.

In spite of that, the importance of technology as a supporting tool can not be denied, as any effort to disseminate knowledge only through meeting rooms will notice. Virtually every initiative referred before have a technologic component, wisely used. This is the case of Buckman Laboratories, as well as Arthur Andersen, which intranet known as KnowledgeSpace combine several databases in a one-stop knowledge shop.

During the last 5 years, some companies began to heavily invest in "knowledge portals". Regardless of the name, such portals are nothing more than a window to employees have access to the whole needed knowledge, internal and external, in a fast, directional and reliable way. Scient, which develops corporate level internet solutions, has developed very powerful knowledge portals. The company was founded in 1997 on knowledge management basis, and its outstanding growth before the dot com crisis in 2001 is an excellent example of the knowledge management potential.

Organizational Design

A second aspect with wide impact in knowledge management projects is the organizational design.

Mostly of the studies concerning organizational design were done before the 90's, but authors like Nonaka and Takeuchi (1995), among others, has emphasized the importance of new forms to better support knowledge management activities.

The oldest and more common of the new forms is the network organization. From this one, new conceptions came up, trying to better adapt the organization to the agility required to answer the challenge of the new economy complexity. In this group we highlight two: the cellular organization, of Miles et al. (1998) and the hipertext organization described by Nonaka and Takeuchi in his classic *The Knowledge-Creating Company* (1995). Even though each of them presents specific characteristics, they also present several points in common. Among the most important is the decentralization not only of decision making but also of the adaptation power. Moreover, both recognize the need of different models to different parts within the same organization. Some companies already adopting attitudes in this regard are Kao (in the chemical sector), Sharp and Acer.

Organizational Culture

The last, and most important aspect in knowledge management is the culture issue. It is important to have all the components to have a winning strategy. Despite that, the cultural issue receives special attention due to its high degree of resistance. While the information technology infra-structure can be bought and implemented in a relatively short time, to change values and beliefs in a corporation is a arduous task, and will usually take some years.

Culture is the combination of a common history, expectations and not written rules, and the social more than affect the behavior of every individual in an organization (O'Dell

and Grayson Jr, 1998). In our case, the most important is that the culture defines the relationship between individual knowledge and organizational knowledge and molds the process by which new knowledge are captured, legitimated and distributed (De Long and Fahey, 1997).

As a result, the cultural aspect should be considered before any other activity involving managing the organizational knowledge. The failure cases due to neglect this statement are not rare too, particularly when the culture do not encourage information and knowledge sharing, like engineering companies in general.

Conclusions

As showed, knowledge management involves much more aspects than what has been normally presented. More important, these aspects influence each other, in a way that the ultimate goal of a corporate knowledge management initiative should be to obtain sustainable competitive advantages. As opposed from a large amount of the available literature, the integrated model proposed emphasize this view, still not detailing the activities that should be executed and their sequence under specific situations.

The model can be highly refined in some of its points, and it suggests further research to achieve some empirical evidences.

Fortunately, new ideas focusing the knowledge in a strategic way begin to arise, and the integrate use of them can prove to be a powerful tool towards success in this changing paradigm.

References

1. Ávila, H. de A.. “Cenários: o estudo de futuros alternativos”, *Ciência e Cultura*, Vol. 41, issue 3 (1989). pp. 214-249.
2. Barnet, W. P. and R. A. Burgelman. “Evolutionary Perspectives on Strategy”. *Strategic Management Journal*, Vol. 17 (1996). pp. 5-19.
3. Barney, J. B.. *Gaining and Sustaining Competitive Advantage*. New York, NY: Addison Wesley, 1996.
4. Barney, J. B.. “Firm Resources and Sustained Competitive Advantage”, *Journal of Management*, Vol. 17 (1991). pp. 99-120.
5. Cole, R. E.. “Introduction”. *California Management Review*. Vol. 40, No. 3, Spring, (1998). pp. 15-21.
6. Davenport, T. H., D. W. De Long and M. C. Beers. “Successful Knowledge Management Projects”. *Sloan Management Review*. Vol. 39, winter, (1998). pp. 43-57.
7. Davenport, T. H. and L. Prusak. *Working Knowledge*. Boston, Massachussets: HBSP, 1998.
8. De Long, D. and L. Fahey. “Building the Knowledge-Based Organization: How Culture Drives Knowledge Behaviors”. *Working Paper*. Maio de 1997.

9. Dixit, A. K. and B. Nalebuff. *Thinking Strategically*. New York, NY: Norton, 1991.
10. Edvinsson, L. and M. S. Malone. *Capital Intellectual*. São Paulo, SP: Makron Books do Brasil, 1998.
11. Fahey, L. and L. Prusak. "The Eleven Deadliest Sins of Knowledge Management". *California Management Review*. Vol. 40, No. 3, Spring, (1998). pp. 265-276.
12. Liebeskind, J. P.. "Knowledge, Strategy, and the Theory of the Firm", *Strategic Management Journal*, Winter Special Issue, Vol. 17 (1996). pp. 93-107.
13. Miles, R. E., C. C. Snow, J. A. Mathews, G. Miles and H. J. Coleman Jr. "Organizing in the knowledge age: Anticipating the cellular form". *Academy of Management Executive*. Vol. 11, No. 4 (1997). pp. 07-20.
14. Nonaka, I and H. Takeuchi. *The Knowledge-Creating Company*. New York, NY: Oxford Univertisy Press, 1995.
15. O'Dell, C. and C. J. Grayson Jr. *If Only we Knew what we Know*. New York, NY: The Free Press, 1998.
16. Pfeffer, J. and G. R Salancik. *The External Control of Organizations.*, New York, NY: Harper & Row, 1978.
17. Porter, M. E.. *Competitive Strategy*. New York, NY: Free Press, 1980.
18. Powell, W. W.. "Learning from Collaboration: Knowledge and Networks in the Biotechnology and Pharmaceutical Industries". *California Management Review*. Vol. 40, No. 3, Spring (1998). pp. 228-240.
19. Schendel, D.. "Editor's Introduction to the 1996 Summer Special Issue: Evolutionary Perspectives on Strategy". *Strategic Management Journal*, Vol. 17 (1996). pp. 1-4.
20. Scott, W. R.. "Organizational Structure". *Annual Review of Sociology*, Vol. 1 (1975). pp. 1-20.
21. Sperder, J.-C. and R.. M. Grant. "Knowledge and the Firm: Overview", *Strategic Management Journal*, Winter Special Issue, Vol. 17 (1996). pp. 5-9.
22. Stewart, T. A.. *Capital Intellectual*. Rio de Janeiro, RJ: Campus Ltda, 1998.
23. Sveiby, K. E.. *A Nova Riqueza das Organizações*. Rio de Janeiro, RJ: Campus Ltda, 1998.
24. Teece, D. J.. "Capturing Value from Knowledge Assets: The New Economy, Markets for Know-How, and Intangible Assets". *California Management Review*. Vol. 40, No. 3, Spring (1998). pp. 55-79.
25. Williamson, O. E. "Strategizing, Economizing, and Economic Organization", *Strategic*

Management Journal, Winter Special Issue, Vol. 12 (1991). pp. 75-94.

26. Zack, M. H.. “Developing a Knowledge Strategy”, *California Management Review*, Vol. 41, No 3, Spring (1999). pp. 125-145.