

Organizational structure features supporting knowledge management processes

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Abstract

Purpose – The idea that knowledge management can be a potential source of competitive advantage has gained strength in the last few years. However, a number of business actions are needed to generate an appropriate environment and infrastructure for knowledge creation, transfer and application. Among these actions there stands out the design of an organizational structure, the link of which with knowledge management is the main concern here. More specifically, the present paper has as its aim to identify the characteristics of organizational structure that facilitate the development of knowledge management processes.

Design/methodology/approach – The research strategy used to achieve this aim is the multiple case study method, which has been applied to six Spanish firms of recognized international prestige characterized by their excellence and proactivity in matters of knowledge.

Findings – In general terms, the results show that these companies adopt flexible, increasingly flat organizational forms with fewer hierarchical levels which not only allow but also encourage communication and teamwork among staff members so that everybody can interact more easily. This makes it possible for employees to take better advantage of their competencies, generating organizational routines and increasing the value of their contributions thanks to the freedom of action they are given.

Originality/value – The main contribution made in this paper lies in the fact that, from a study of business practices, it describes the way in which certain Spanish companies construct knowledge socially and orient their behavior through their organizational structure.

Keywords Knowledge management, Knowledge processes, Organizational structures, Competitive advantage, Spain

Paper type Case study

Introduction

One cannot deny the importance attributed to knowledge, mainly since the 1990s. Knowledge has actually become the key resource for the generation of sustainable income and the creation of wealth (Drucker, 1993; Spender, 1996; Grant, 1996; Sveiby, 1997). Within this framework, the knowledge-based view has as its main premise that knowledge creation and transfer plays an essential role in the existence of a company compared with market mechanisms (Kogut and Zander, 1992; Conner and Prahalad, 1996). Knowledge originates from unique experiences and organizational learning, and very often it is present not only in written documents but also in the routines, tasks, processes, practices, rules and values of organizations (Bhagat *et al.*, 2002). It is a dynamic concept that stems from the interactions between individuals and organizations and can be defined as context-specific insofar as it is associated with a specific time and place (Nonaka *et al.*, 2000; Hayek, 1945). All this shapes knowledge as a strategic resource that competitors will find it hard to imitate, the competitive advantages associated with it being most likely to become sustainable in the long term (Tyre and Von Hippel, 1997; Teece *et al.*, 1997).

Since knowledge is of great importance to firms, which in turn are conceptualized as institutions oriented toward knowledge integration (Grant, 1996), knowledge management

“Organizational design is one of the factors that will greatly influence the implementation of a knowledge management process.”

becomes a fundamental task and one of the challenges of our time. In this respect, although knowledge management is defined in a wide range of ways in the literature (Quintas *et al.*, 1997; Wiig, 1997; Bueno, 1998; Davenport *et al.*, 1998; Guns and Välikangas, 1998), the existence of common elements in all the definitions leads us to define “knowledge management” as the set of business policies and actions undertaken for the purpose of favoring the creation of knowledge, its transfer to all firm members and its subsequent application, all of it with a view to achieving distinctive competencies which can give the company a long-term competitive advantage. The basic goal of knowledge management is, therefore, a simultaneous improvement of productivity and competitiveness that can provide a sustainable competitive advantage difficult to imitate by competitors and place the firm in a position of leadership within its sector (PricewaterhouseCoopers, 2001).

Among the business policies that can help to create the necessary infrastructure and the appropriate environment where knowledge management processes can receive support stand out the following: a human resource management scheme focused on attracting and retaining talent; a corporate culture which is open to new ideas and fosters learning; a technological platform which can collect and disseminate knowledge; a strategic approach to knowledge; and an organizational design which makes interpersonal communication and interaction easier.

This paper focuses on the last of these policies, its aim being to answer the main research question: what are the organizational structure features which support the development of knowledge management processes? The answer to this question will be derived from the analysis of firms which excel in the area of knowledge management, are internationally prestigious and show a passion for knowledge that has led them to build the infrastructure required to explore and exploit this resource to the full.

In this sense, the main contribution of this paper is that, based on a study of business practices, it shows how certain Spanish companies construct knowledge socially and orient their behavior through their organizational structure.

In order to achieve the objectives described above, the paper is structured as follows. After the introduction, the link existing between knowledge management and the resource-based view as well as the role played by the organizational structure within the framework of knowledge management are discussed from a theoretical standpoint. A description of the research methodology follows, after which can be found the empirical evidence obtained from the analysis of the multiple case study. The paper finishes with a conclusions section that includes some considerations related to the analysis performed and suggests some future research lines. Additionally, the bibliography used in this research study is also presented.

Literature review

Knowledge management from the resource-based view

Penrose in her *The Theory of the Growth of the Firm* (Penrose, 1959), authors such as Wernerfelt (1984), Rumelt (1984), Barney (1991), Grant (1991), Mahoney and Pandian (1992), Peteraf (1993) and Collis and Montgomery (1995) began to highlight the value of firm-specific factors when it comes to explaining the differences in financial income between companies belonging to the same activity sector and exposed to similar success factors.

The above-mentioned works together with the search for new paradigms relegated the industrial organization model to the background and paved the way for the adoption of the resource-based view as the predominant paradigm. According to this approach, business income does not come from positioning products in the market; what matters is the possession of strategic resources, i.e. specific resources that are scarce and difficult to imitate and transfer (Wernerfelt, 1984; Barney, 1991; Grant, 1991; Peteraf, 1993; Amit and Schoemaker, 1993). Barney (1991, p. 105) backs this hypothesis when he states that “not all the resources owned by a firm have the potential to provide a sustainable competitive advantage”. Resources and capabilities thus appear as the origin and the cause of business competitiveness and competitive advantage (Grant, 1991).

Halfway through the 1990s, and as a result of the turbulence existing in the competitive environment, intangible assets acquired a growing importance and the “knowledge-based view of the firm” – which as said above sees knowledge as the main source of business income and the most important resource strategically speaking – started to emerge. In the opinion of Nelson and Winter (1982), this resource is the result of the experiences developed by firm members over time, while Hoskisson *et al.* (1999, p. 442) argue that “due to its tacit and socially complex character, the knowledge stock owned by a company is a crucial determining factor in its competitive advantage”. This idea is reflected in Figure 1.

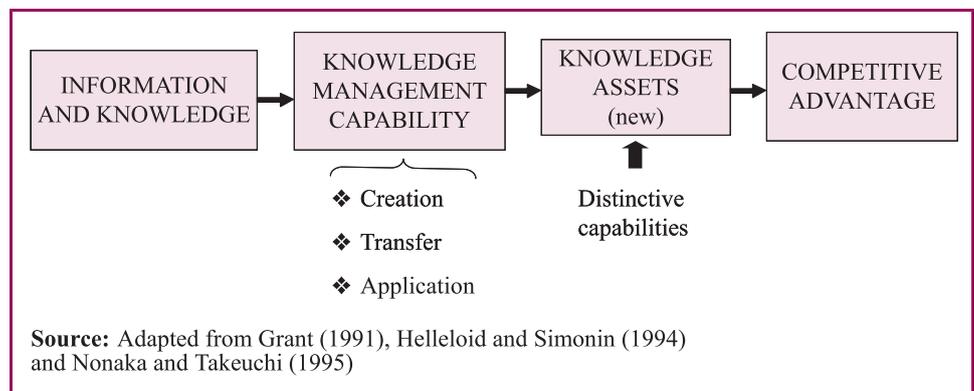
As a result, knowledge management has become a fundamental task and one of the challenges of our time, its overall aim being to maximize the firm’s effectiveness as well as the income produced by its knowledge assets and renew the latter constantly (Wiig, 1997; Shariq, 1997).

The role of organizational structure in knowledge management

It has already been pointed out that organizational design is one of the most influential elements as far as the implementation of a knowledge management process is concerned. According to Mintzberg (1979), the organizational structure can be defined as the result of the combination of all the ways in which work can be divided into different tasks, the coordination of which must subsequently be ensured.

Given that knowledge is of vital importance to all firms and bearing in mind that the way in which they are organized determines the degree to which knowledge circulates both inside the organization and between the organization and its business environment, firms must adopt organizational structures which allow them to create and transfer as much knowledge as possible. It must be remembered that knowledge may sometimes not be taken advantage of as much as it should due to the organization model prevailing in the organization. In the words of Leibenstein (1966, p. 404), “knowledge, just like capital and work, is sometimes underused; its potential may not be used to the full”. In these cases, it is advisable to adopt organizational structures that do not stifle the organization, allowing knowledge to flow and materialize in actions that guarantee success for the company.

Figure 1 Causality chain of knowledge-based competitive advantage



Furthermore, Miles and Snow (1978) argue that the structural characteristics act as an information filter, limit what an organization can see and perceive and, therefore, what it can learn. Along the same lines, Miller (1987) claims that organizational structure influences information flows as well as the context and nature of human interactions. For that reason, at least from a theoretical point of view, the trend observed is the transition from bureaucratic, hierarchical structures to increasingly organic, flexible ones. The horizontal organization, structured around multi-function work teams that facilitate the dissemination of information throughout the firm is regarded as a better option than the typical vertical structure (the functional one), which makes knowledge transfer more difficult (Lei and Slocum, 1992; Kanter, 1994).

Drucker (1992) considers that a modern company must be organized to pursue innovation and to remove systematically whatever is seen as established and accommodating. It must additionally be ready for permanent change, putting knowledge to work, which requires a high decentralization level so that decisions can be made quickly. Similarly, Miller (1986) and Morand (1995) point out that organic organizations are characterized by a set of structural arrangements, such as a low degree of formalization when specifying work responsibilities, a nearly complete lack of division of the activities to be performed, few rules, a significant lateral communication with few hierarchical distinctions and finally, a decentralization of the decision making process. Informality can play a relevant role inside these organizations, where a certain degree of innovation, interpersonal cohesion and flexibility are expected. This type of structure is also said to be ideal to carry out complex unusual tasks with the collaboration of groups of specialists from different areas to which authority has been delegated. These groups work together using different linkage devices and information systems, including meetings and horizontal as well as vertical communication.

The so-called "adhocracy", one of the structural forms proposed by Mintzberg (1979), is fairly close to the organic model discussed above. It can be said that this type of structure seems appropriate for organizations that have to be innovative in complex ways, because they need a high degree of flexibility and decentralization for their experts, who usually work in multidisciplinary teams and seldom on their own. Behaviors are hardly standardized or formalized within this type of organizational structure.

Additionally, and in parallel to the evolution of the environment, new and different organizational structures have emerged through which an attempt is made to shape organizations so that they can adapt to their business environment. As Galbraith (2002) puts it, the business world has changed and many of the solutions to current problems stem from new organizational designs. On the basis of the growing environmental complexity, an essential role is attributed to knowledge in some of these designs, e.g. the "N-form corporation" (Hedlund, 1994), the federated structures (Handy, 1992, 1994), the hypertext structure (Nonaka and Takeuchi, 1995), the "middle-up-down" management system (Nonaka, 1988) and the J-form (Lam, 2000).

Methodology

Since the theory about knowledge management still represents an emergent and sometimes confusing area, the case study method seems to be the most suitable research strategy when trying to answer the main research question posed in the introduction: what are the organizational structure features which support knowledge management?

Due to its special characteristics, the case study method allows us to take a closer look at the unit analyzed. Hamel *et al.* (1993, p. 34) emphasize the descriptive nature of the case study method when they describe it as "the in-depth study of one particular case". Yin (1994, p. 13) defines it as "empirical research which examines a current phenomenon within its actual context, particularly when the limits between the phenomenon and the context are not immediately evident and multiple sources of evidence are used". For Eisenhardt (1989, p. 534), the case study is "a research strategy based on understanding the dynamics which develop in singular contexts". According to this author, the case study is a fundamental device not for theory-verification but for theory-building.

Hopefully, the answer to the question above will help us to understand the general guidelines followed by the firms that implement knowledge management processes in relation to their organizational structure. The multiple case study method has been selected as opposed to the single case one with the aim of identifying behavioral patterns that can allow the extrapolation of results (“replication logic”, Yin, 1994, 1998) through the evidence obtained from companies operating in different economic, organizational and sectorial contexts. A single case study would not be very representative as the conclusions would be confined to a specific type of organization and sector of activity.

Case selection was based on a non-random sampling in which those cases that could potentially provide better learning opportunities were chosen, always taking into account the recommendation that there should be four cases at least and ten at the most (Eisenhardt, 1989). As a result, six Spanish firms of recognized international prestige belonging to different economic sectors were selected, all of them characterized by their proactive attitude with regard to knowledge and by the efforts to bring their experiences in this field to the attention of stakeholders. Proactivity in matters of knowledge can be reflected in the fact that these are organizations where knowledge management forms part of everyday life and where, in a deliberate or emergent way, the very best is done to create, transfer and apply knowledge. Additionally, these firms are often present in forums and seminars or workshops about business and knowledge and collaborate with universities to undertake joint projects thanks to which some light can be shed on this emergent area within firm strategic management. Table I describes the activities performed by these companies and Table II shows the research specifications.

Table I Activities carried out by the firms under study	
<i>Firm</i>	<i>Activities</i>
Electrotécnica Artech Hermanos S.A.	Manufacturing of electric engines, transformers, generators, relays and measurement and protection systems
Unión Fenosa	Production and distribution of electric energy, gas and provision of professional services (Soluziona)
PricewaterhouseCoopers (Spanish subsidiary)	Business administration and management consultancy activities. Audits
Siemens S.A. (Spanish subsidiary)	Electrical installations. Manufacturing of electric engines, generators and transformers
Grupo Telefónica	Internet, fixed and mobile telephone services; content production and distribution, phone books and directories
Grupo Santander	Banking activities; management of investment and pension funds

Table II Research specifications	
Firms under study	Electrotécnica Artech Hermanos S.A. (Artech) Unión Fenosa (UF) PricewaterhouseCoopers (PWC) Siemens España S.A. Grupo Telefónica (G. TELEF) Grupo Santander (G. SANT)
Unit of analysis	Firm
Dates on which fieldwork was carried out	March-September 2004
Type of interview	Semi-structured or in-depth interview

In order to avoid possible biases on the part of the researcher himself and/or the informers, the “triangulation” method was used. Three methodologies were combined:

1. In-depth interview with the chief knowledge officer (CKO) and, in his/her absence, with the person in charge of the position that is more closely related to the issues analyzed. A standard questionnaire with open, concrete and specific questions was prepared which was later adapted to each one of the companies under examination. The interviews lasted three hours on average and all of them were recorded, with the interviewee's consent, and later transcribed. Until the final report on each case was completed, telephone and email contact was maintained in order to clarify any potential doubts that might arise.
2. Observation was possible through visits to the premises of companies. Despite being a secondary data collection source, it becomes crucial to the research work because, thanks to observation, researchers can discover the reality they are dealing with.
3. Consultation of documents found on the Internet and obtained from both internal and external publications (website, books and published articles, annual reports and other corporate reports).

Empirical evidence

Arteche

In 1995, Arteche initiated a process of strategic reflection which led to the identification of some values that should be developed, namely customer orientation, internationalization and expansion to all markets, functioning as a group and not as separate or independent firms, new product development, cost reduction, exploitation of everyone's capabilities (intelligent organization) and the consolidation of an organizational design based on empowerment instead of hierarchy.

A number of actions were undertaken in order to develop these values. Although these actions were not explicitly formulated as a knowledge management program, in fact they turned out to be closely related to it. In particular, the desire to operate as a Group and not as independent companies, new product development and the exploitation of everyone's capabilities meant that the knowledge existing in each plant had to be shared and new knowledge had to be generated for competing purposes. Arteche is much smaller than its competitors and, therefore, it could not compete in terms of size, but it could compete indeed in terms of flexibility, response speed, adaptation to customer needs, etc; in other words, in terms of knowledge and competencies. The challenges facing this company at present are the following:

- The laws of supply and demand keep changing due to the globalization, the emergence of new concerns (such as pollution-free production and environmental impact), the convergence of sectors, etc.
- If an organization wants to achieve a competitive advantage, it must adapt to, anticipate and promote changes.
- Any relationship with the outside world and the information associated with it can provide a reason to change.

Arteche can only hope to respond to these challenges adequately if it develops a network or self-organizational model characterized by its complexity (every single person is involved), flexibility (in response to an unpredictable, random market) and openness (the company depends on its external environment). For this purpose, the company is organized with practically no hierarchies whatsoever and in such a way that work groups and project-based teams prevail.

Arteche's organizational model mixes a stable structure one with another ad-hoc structure. With the aim of becoming fully customer-oriented, Arteche has set up technical-commercial offices for each one of the group's product lines. Contact with customers is guaranteed by means of these offices, which receive information about customer wishes that is later transferred to the production units at each one of the group's plants. The other departments

(finance, information systems, sales, social responsibility etc.) act as means of support in this whole process with a view to reaching the highest possible customer satisfaction levels. All this shapes a stable structure formed by the company's different responsibility areas, which have daily management indicators to control whatever happens. As mentioned above, there is also an ad-hoc structure made up of project-based groups and multi-function work teams with a leader and a number of collaborators who are supposed to deal with a specific issue. Such an ad-hoc structure formed by work teams is very important from the knowledge creation point-of-view, as it is there that nearly all the most operational knowledge owned by the group is generated. We cannot forget that each person operates within a stable structure but at the same time belongs to the *ad hoc* structure (participating in projects and work teams).

Unión Fenosa (UF)

UF was born after the 1982 merger between two firms – Unión Eléctrica Madrileña S.A. and FENOSA – with different cultures, organizations, systems and strategies. At present, however, this company represents the result of a long, deep and far-reaching transformation: from a starting position in which the organization focused exclusively on electricity, UF has now consolidated as an important, integrated business group of international renown which is present in strategic sectors of the world's economy. It could be said that, after the merger, this firm's culture focused on coming out of the crisis and surviving successfully as an independent company. This is so mainly because the organization has been able to evolve and look at change as something not only necessary but also natural and essential. One of the aspects facilitating this change is its organizational design. With regard to this, Unión Fenosa is an increasingly flat organization that encourages the creation of work groups oriented to the achievement of objectives. Despite this, a certain degree of hierarchy characterized by the improved relationship and communication between managers and collaborators still exists. All firm members are aware that the organization has a task to fulfill as well as important goals to achieve and also that their contribution is needed for the organization to succeed. In this context, individualized behaviors do not count any more; teamwork has become one of the group's main values. In fact, teamwork plays a relevant role in performance management, which suggests that firm members share full responsibility for what happens in the processes developed by the company as a whole as well as in their specific field of activity.

PricewaterhouseCoopers (PWC) (Spanish subsidiary)

Seeing the importance of knowledge as an essential element in the services provided by PWC, this organization decided to implement a knowledge management policy in a deliberate way. It became clear for the company that the knowledge management project represented a strategic issue which would help the merger between Price Waterhouse and Coopers & Lybrand in 1998. Since then, the new organization has always had a well-defined organizational structure for knowledge management with a specific budget allocated to it.

PWC has a partnership structure. This legal figure, which does not exist in Spain, is based on the financial contributions made by the partners, who are joint owners of the business, share the same objectives and are equally accountable for the decisions related to the running of the business. A certain degree of hierarchy along with the supervision and control of their subordinates by the managers and directors are consequently present in this type of structure. The role of hierarchy is particularly strong at the decision-making level, which according to PWC has a positive impact in the sense that it protects individual firm members, who know where they stand and what possibilities they have to carry out tasks within certain limits. However, that hierarchy is neutralized by the creation and setting-up of work groups. Project-based work is very common in PWC, teamwork being essential too. There are many inter-department and inter-division groups with people from various business areas, internal innovation groups, technology committees, etc. that seek to develop knowledge synergies in an attempt to find solutions applicable to a large number of customers and help cross-sales as well. The organizational structure and the way of working are the same in all the countries where PWC operates.

Siemens (Spanish subsidiary)

The combined effect of globalization and the deregulation of the telecommunications market, together with the significant technological developments made by this firm, have allowed Siemens to bring into the market new products, solutions and services with an increasingly high added value to the customer. For this reason, Siemens has become a synonym for innovation, customer focus and global competitiveness. It is also characterized by a diversified business portfolio which guarantees stability in difficult times and allows the creation of a solid and exclusive product through the exploitation of its synergies. All this is expressed in the motto "Siemens-global network of innovation".

In 1992, Siemens AG's new CEO, Dr H. Pierer, came to the conclusion that the organization needed to focus on its most valuable asset: its knowledge base. As a result, Siemens became an e-company. Pierer recognized the importance of capitalizing on knowledge when it comes to creating a competitive advantage and clearly saw the need for Siemens to stop being a traditional product-led firm in order to become a service-led company with greater added value. Knowledge management was the answer to many of the issues arising at the time and if success was achieved in sharing knowledge across business units, each of them would benefit from the advantage and experience of the others. The Communities of Practices (CoPs) were the solution that allowed Siemens to exploit knowledge synergies through the following three areas:

1. *Vertical knowledge management solutions (divisional CoPs)*, i.e. area-specific businesses with cross-border links between business units to ensure a high degree of knowledge transfer at an international level.
2. *Horizontal knowledge management solutions (horizontal CoPs)*, in which an information-sharing culture is fostered among the staff.
3. *Collaboration with customers in knowledge management (CoPs with customers)*, through which knowledge can be shared and exchanged with customers, who make it easier for Siemens to find more satisfactory solutions and improve its products and, at the same time, offer the firm the chance to learn more about customer needs.

For the purpose of supporting knowledge management processes, Siemens is developing an increasingly organic organizational structure with fewer hierarchical levels where work groups and project-based teams have become an essential part of the group's daily life. To this must be added the provision of better links between all the firms and divisions that make up the group. Teamwork is one of Siemens' main values and the basis for the improvement of its processes. Over 80 improvement teams collaborate in the optimization of business processes that will allow Siemens to deliver a better service to its customers.

Telefónica Group

The Compañía Telefónica Nacional de España (Spain's national telephone company) was founded in Madrid on April 19, 1924 as a public limited company. Since then and up to the present day, it has gone through a deep transformation derived from the deregulation of the telecommunications market and the ever-increasing globalization. The accumulation of knowledge and expertise in the telecommunications sector has allowed Telefónica to capitalize on these two elements in its operations abroad. This is an organization which combines the essence of its still somewhat conservative character inherited from the monopoly maintained until very recently with a modern approach where the new business focus and the changes introduced no doubt identify a firm perfectly adapted to the new challenges posed by the knowledge and information society.

Thus, Telefónica has opted for modernity and change, incorporating whatever adds value and improves the organization's relationships with its business environment. In fact, Telefónica encouraged all actions related to change management in 2000 with the aim of facilitating its transformation into an e-company. All the changes occurred have gradually altered Telefónica's internal structure to such an extent that, although a certain degree of hierarchy will always be present because of its "civil-service" background, work groups as

“ It is necessary for companies to adopt an organizational structure that allows them maximum creation and transfer of knowledge.”

well as the improved relationships among staff members are helping to make the organization more and more horizontal and flexible.

Notwithstanding the above and regardless of all that has been done since 2000 and the cultural changes associated with it, all the firms affiliated to the group have been implementing policies to become flatter for some time now. This company has started to reduce its hierarchy component in two main ways: removing hierarchical levels (only six of them have remained); and through the use of transversality (reflected in the creation of a considerable number of multidisciplinary work teams set up to develop inter-area projects, thus providing the company with great versatility). This increasingly flat structure favors the active participation of the whole organization, the combination of top-down and down-top management methodologies being essential. The middle managers are considered a key element in the communication process according to this approach.

Santander Group

The Santander Group was able to recognize that the traditional management systems were not sufficient to offer an efficient response to an environment that was becoming increasingly complex, dynamic and difficult to predict. For this reason, and in accordance with its strategic vision (being a financial Institution that can act faster and better than the rest), this group's mission is no other than “setting up systems, tools and work environments where it is possible to manage efficiently the information and knowledge required to respond to the strategy, the plans and the objectives of the organization”; all of it for the purpose of generating value for shareholders, customers and staff.

Seeing the importance of intangible assets and the need to provide more information than that appearing in the conventional financial statements for shareholders and investors, the Santander Group gave serious thought to the possibility of creating its own intellectual capital model, using first the Intellect Model (1998) and adopting the Intellectus Model (2003) later. However, the key to success lies not only in implementing systems to measure the relevant intangible assets, but also in strengthening the latter through the so-called knowledge management systems. One cannot deny the efforts made by the Santander Group to identify its intangible assets as well as the best practices that add value and to exploit those practices extending them throughout the organization. It is usually far from easy to undertake such activities in a short period of time, as they require a number of work environments and systems that make them possible.

Organizational design and knowledge communities form part of the infrastructure needed to succeed in accumulating and distributing knowledge on the one hand, and to boost confidence, dialogue and cooperation among the staff on the other. Knowledge communities represent a virtual meeting point where firm members discuss a specific topic of interest on the basis of the contributions made and the knowledge retained. As for organizational design, it can be said that the Santander Group's structure is gradually becoming more and more horizontal, with a stronger focus on flexibility and communication. The organizational levels that can be found in central services are: managers, heads of project, heads of unit and heads of department. However, there are many more internal and administrative levels in terms of pay. This increasingly flat structure leads to the proliferation of work groups. In fact, teamwork, along with dynamism, is a very important value within the Group, as shown by the existence of multidisciplinary projects where people from different departments are involved. These work groups and projects provide a powerful mechanism thanks to which the organization can learn to achieve the flexibility needed to adapt to market changes.

Conclusions: discussion and future research lines

Since the 1990s, knowledge has started to be considered the main strategic resource and the basis for the differentiation of numerous companies. That is why knowledge management – which focuses on the creation, transfer and application of this resource – has acquired an essential importance as a source of competitive advantage, giving rise to different results across organizations. This type of management requires a number of business policies that can facilitate it. Among these policies is organizational structure design, the link of which with knowledge management is the central issue discussed in the present paper. It must be remembered that the objective sought was to answer the main research question that would allow us to identify the features of organizational structure that support or facilitate the development of knowledge management processes. Keeping this premise in mind, it was decided to use the multiple case study method, applying it to six Spanish companies characterized by their excellence and proactivity in matters of knowledge.

It can be inferred from the analysis that all the companies examined have managed to recognize the role played by knowledge in recent years and are perfectly aware that they have to compete by knowledge at present. These are excellent firms which have incorporated knowledge management into their work philosophy, paying special attention to the relevance that the creation, transfer and subsequent application of this resource has for their survival within their respective sectors and for their consolidation as increasingly competitive organizations. As a result, they know that the way in which a firm is structured and organized turns out to be important when it comes to approaching and coordinating staff with the aim of creating knowledge synergies. This is why practically all these firms tend to show increasingly horizontal, flexible structures with fewer hierarchical levels and a widespread communication at all organizational levels, which supports the arguments presented in the second section. A horizontal structure not only implies an enhanced communication but also the decentralization of the decision-making process and the empowerment that is typical of these companies. Some of them, like UF and the Telefónica Group, combine a certain degree of hierarchy with a more organic structure. Nevertheless, the organic structure appears to be gaining ground with respect to the hierarchical one (an example of this is the implementation of the middle-up-down management process by the Telefónica Group). PWC, instead, still maintains a strongly hierarchical structure which stems to a large extent from the partnership structure itself, but the existing degree of supervision and control suffers a reduction and is compensated by the proliferation of work teams and project-based groups, all of which increases the relationships between managers and collaborators. In addition to its stable structure, Arteché has another adhocratic structure which keeps transforming itself because it is formed by the work groups created according to the company's needs. Siemens and the Santander Group use communities of practices and communities of knowledge respectively in order to bridge the gaps between staff members, fostering communication as well as the sharing and distribution of the knowledge about certain topics. Additionally, one can hardly deny the relevance that teamwork and interpersonal coordination have for all the firms analyzed in terms of putting knowledge to work and subsequently obtaining further-reaching solutions that can help to face challenges.

All the above answers our main research question and clearly identifies what features of organizational structure support the development of knowledge management processes, particularly in companies where these processes form part of their strategy. On the whole, they adopt flexible organizational designs; i.e. increasingly flat structures with fewer hierarchical levels in order to allow dialogue and team work among staff members and encourage interaction between all firm members, so that collective learning can be generated from the knowledge owned by individuals. This will allow employees to take better advantage of their individual capabilities, to generate organization routines and to increase the value of their contributions thanks to the freedom of action they are given.

However, it is important to mention that, despite this growing preference for more organic structures, certain aspects typically associated with bureaucratic models are still found in

most of the firms analyzed. After all, these are large companies where the existence of certain rules, regulations and written documents becomes necessary in order to keep control over the whole organization.

This paper has allowed us to explore the main patterns followed by a group of firms when it comes to designing their organizational structure. The methodology used does not allow us to extrapolate the results to all businesses though, which highlights that organizational structure design may depend on the specific characteristics of each firm[1], of the sector and finally, of the country where the activity is developed. The contingency theory assumes an essential role in this respect, as it can lead to identify structural features different from the ones discussed in this study.

In our view, the organizational structure features should be firstly supported by a set of objectives unmistakably oriented toward the generation of knowledge as a strategic resource so that knowledge creation and transmission within the organization can be facilitated. The presence of certain attitudes and values at the top management level is needed to achieve this goal. Managers and executives must show an open mentality in matters of knowledge, because only if they believe that knowledge can become a strategic resource, will they try to create the appropriate conditions for this to happen.

Considering what has been said above, it is also important for the organization to adopt a business culture that encourages these values. Otherwise, no matter how adequate the organizational structure design might be, employees may not feel motivated to transfer the knowledge acquired, especially if they come to the conclusion that this can be damaging rather than beneficial to them. Therefore, it would be advisable to create an environment in which sharing knowledge is rewarded in some way. The human element thus becomes a factor of vital importance, as employees are the ones who own the knowledge and those who must show their ability to use it properly.

Now that our objective has been met, the main limitations of this work must be highlighted, after which some future research lines will be suggested. Regarding limitations, there is firstly the fact that the firms studied stand out as the most advanced ones in matters of knowledge, which may produce excessively favorable results; and secondly, the actual methodology used because, although we decided to use the multiple case study method instead of the single case approach in order to avoid lack of representativeness, the study does not permit the extrapolation of results to a larger population. Likewise, organizational structure features may be affected by another type of variables, apart from knowledge, which differ considerably across firms.

Consequently, as possible research lines for the future, it would be interesting to carry out in-depth analyses of other firms which, despite having recognized the strategic relevance of knowledge, have still not been able to create the appropriate organizational conditions to encourage its creation and transmission. This would make it possible to draw a comparison with the results obtained in the present study. Similarly, it would be very enriching to extend the analysis to firms of different nationalities, as this would allow us not only to identify certain similarities or differences regarding the organizational structures developed by each one of them but also to incorporate into the study additional variables which could turn out to be relevant in terms of knowledge creation and transfer. Finally, a quantitative methodology based on statistical and econometric techniques should be applied to the analysis of organizational structure-knowledge management relationships.

Note

1. For instance, size, objectives, strategies, resources or organizational culture.

References

- Amit, R. and Schoemaker, P.J. (1993), "Strategic assets and organizational rent", *Strategic Management Journal*, Vol. 14 No. 1, pp. 33-46.
- Barney, J. (1991), "Firms' resources and sustained competitive advantage", *Journal of Management*, Vol. 17 No. 1, pp. 99-120.

- Bhagat, R., Kedia, B., Harveston, P. and Triandis, H. (2002), "Cultural variations in the cross-border transfer of organizational knowledge: an integrative framework", *Academy of Management Review*, Vol. 27 No. 2, pp. 204-21.
- Bueno, E. (1998), "El Capital Intangible como Clave Estratégica en la Competencia Actual", *Boletín de Estudios Económicos*, Vol. LIII No. 164, pp. 207-29.
- Collis, D.J. and Montgomery, C.A. (1995), "Competing on resources: strategy in the 1990s", *Harvard Business Review*, Vol. 73 No. 4, pp. 118-28.
- Conner, K. and Prahalad, C.K. (1996), "A resource-based theory of the firm: knowledge versus opportunism", *Organization Science*, Vol. 7 No. 5, pp. 477-501.
- Davenport, T., De Long, D. and Beers, M. (1998), "Successful knowledge management projects", *Sloan Management Review*, Vol. 39 No. 2, pp. 43-57.
- Drucker, P. (1992), "The new society of organizations", *Harvard Business Review*, Vol. 70 No. 5, pp. 95-104.
- Drucker, P. (1993), *Post-Capitalist Society*, HarperCollins, New York, NY.
- Eisenhardt, K. (1989), "Building theories from case study research", *Academy of Management Review*, Vol. 14 No. 4, pp. 532-50.
- Galbraith, J.R. (2002), *Designing Organizations: An Executive Guide to Strategy, Structure, and Process*, Jossey-Bass, San Francisco, CA.
- Grant, R. (1991), "The resource-based theory of competitive advantage: implications for strategy formulation", *California Management Review*, Vol. 33 No. 3, pp. 114-35.
- Grant, R. (1996), "Toward a knowledge-based theory of the firm", *Strategic Management Journal*, Vol. 17, pp. 109-22.
- Guns, W. and Välikangas, L. (1998), "Rethinking knowledge work: creating value through idiosyncratic knowledge", *Journal of Knowledge Management*, Vol. 1 No. 4, pp. 287-93.
- Hamel, J., Dufour, S. and Fortin, D. (1993), *Case Study Methods*, Sage, Newbury Park, CA.
- Handy, C. (1992), "Balancing corporate power: a new federalist paper", *Harvard Business Review*, Vol. 70 No. 6, pp. 59-72.
- Handy, C. (1994), *The Empty Raincoat: Making Sense of the Future*, Hutchinson, London.
- Hayek, F.A. (1945), "The use of knowledge in society", *The American Economic Review*, Vol. 35, September, pp. 519-30.
- Hedlund, G. (1994), "A model of knowledge management and the N-form corporation", *Strategic Management Journal*, Vol. 15, pp. 73-90.
- Hoskisson, R., Wan, W., Yiu, D. and Hitt, M. (1999), "Theory and research in strategic management: swings of a pendulum", *Journal of Management*, Vol. 25 No. 3, pp. 417-56.
- Kanter, R.M. (1994), "Collaborative advantage", *Harvard Business Review*, Vol. 72 No. 4, pp. 96-108.
- Kogut, B. and Zander, U. (1992), "Knowledge of the firm, combinative capabilities, and the replication of technology", *Organization Science*, Vol. 3 No. 3, pp. 383-97.
- Lam, A. (2000), "Tacit knowledge, organizational learning and societal institutions: an integrated framework", *Organization Studies*, Vol. 21 No. 3, pp. 487-513.
- Lei, D. and Slocum, J.W. Jr (1992), "Global strategy, competence-building and strategic alliances", *California Management Review*, Vol. 35 No. 1, pp. 81-97.
- Leibenstein, H. (1966), "Allocative efficiency vs. 'X-efficiency'", *The American Economic Review*, Vol. 56 No. 3, pp. 392-415.
- Mahoney, J. and Pandian, J. (1992), "The resource-based view within the conversation of strategic management", *Strategic Management Journal*, Vol. 13 No. 5, pp. 363-80.
- Miles, R.E. and Snow, C.C. (1978), *Organizational Strategy, Structure and Process*, McGraw-Hill, New York, NY.

- Miller, D. (1986), "Configurations of strategy and structure: towards a synthesis", *Strategic Management Journal*, Vol. 7 No. 3, pp. 233-49.
- Miller, D. (1987), "Strategy making and structure: analysis and implications for performance", *Academy of Management Journal*, Vol. 30 No. 1, pp. 7-32.
- Mintzberg, H. (1979), *The Structuring of Organizations*, Prentice-Hall, Englewood Cliffs, NJ.
- Morand, D.A. (1995), "The role of behavioral formality and informality in the enactment of bureaucratic organizations", *Academy of Management Review*, Vol. 20 No. 4, pp. 831-72.
- Nelson, R. and Winter, S. (1982), *An Evolutionary Theory of Economic Change*, Harvard University Press, Cambridge, MA.
- Nonaka, I. (1988), "Toward middle-up-down management: accelerating information creation", *MIT Sloan Management Review*, Vol. 29 No. 3, pp. 9-18.
- Nonaka, I. and Takeuchi, H. (1995), *The Knowledge-creating Company*, Oxford University Press, New York, NY.
- Nonaka, I., Toyama, R. and Konno, N. (2000), "SECI, Ba and leadership: a unified model of dynamic knowledge creation", *Long Range Planning*, Vol. 33 No. 1, pp. 5-34.
- Penrose, E.T. (1959), *The Theory of the Growth of the Firm*, John Wiley, New York, NY.
- Peteraf, M. (1993), "The cornerstones of competitive advantage: a resource-based view", *Strategic Management Journal*, Vol. 14 No. 3, pp. 179-91.
- PricewaterhouseCoopers (2001), *Hacia Una Economía del Conocimiento*, Esic-Editorial-PricewaterhouseCoopers, Madrid.
- Quintas, P., Lefrere, P. and Jones, G. (1997), "Knowledge management: a strategic agenda", *Long Range Planning*, Vol. 30 No. 3, pp. 85-391.
- Rumelt, R. (1984), "Towards a strategic theory of the firm", in Lamb, R. (Ed.), *Competitive Strategic Management*, Prentice-Hall, Englewood Cliffs, NJ, pp. 556-70.
- Shariq, S. (1997), "Knowledge management: an emerging discipline", *Journal of Knowledge Management*, Vol. 1 No. 1, pp. 75-82.
- Spender, J.C. (1996), "Making knowledge the basis of a dynamic theory of the firm", *Strategic Management Journal*, Vol. 17, pp. 45-62.
- Sveiby, K. (1997), *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets*, Berrett-Koehler Publishers, San Francisco, CA.
- Teece, D., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18 No. 7, pp. 509-33.
- Tyre, M.J. and Von Hippel, E. (1997), "The situated nature of adaptive learning in organizations", *Organization Science*, Vol. 8 No. 1, pp. 71-83.
- Wernerfelt, B. (1984), "A resource based view of the firm", *Strategic Management Journal*, Vol. 5 No. 2, pp. 171-80.
- Wiig, K. (1997), "Knowledge management: an introduction and perspective", *Journal of Knowledge Management*, Vol. 1 No. 1, pp. 6-14.
- Yin, R. (1994), *Case Study Research: Design and Methods*, 2nd ed., Sage Publications, Newbury Park, CA.
- Yin, R. (1998), "The abridged version of case study research", in Bickman, L. and Rog, D. (Eds), *Handbook of Applied Social Research Methods*, Sage Publications, Thousand Oaks, CA, pp. 229-59.

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