

The role of the integration architecture and psychology for exploiting knowledge in acquisitions

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Résumé: Il y a multitude des logiques qui peuvent être à l'œuvre dans le cadre d'une acquisition. Dans ce travail nous nous intéressons à une des plus importants motivations des acquisitions dernièrement, c'est-à-dire, l'exploitation ou le transfert des connaissances entre l'acquéreur et la cible. Mais dans le succès du transfert des connaissances le management du processus d'intégration est clé. Ce pour cela que l'objectif de cette recherche est d'analyser les déterminants du niveau d'exploitation des connaissances dans le processus d'intégration post-acquisition. Ainsi nous avons combiné les apports de l'approche par les connaissances au sujet du rôle des principaux mécanismes de coordination –centralisation, formalisation et socialisation- avec le courant processuel analysant l'influence du côté psychologique de l'intégration sur la création de valeur. En utilisant la technique *Partial Least Squares* sur un échantillon de 45 acquisitions espagnoles réalisées pendant la période comprise entre les années 2000 et 2006 nous avons démontré que le processus d'intégration des acquisitions pour l'exploitation des connaissances compte sur hauts niveaux d'intégration. Cette intégration exige centralisation, socialisation et formalisation entre l'acquéreur et la cible. Cependant la création de valeur de l'acquisition s'explique beaucoup mieux quand on considère la psychologie des relations d'intégration –moyennant le style d'intégration- avec l'architecture des relations d'intégration des acquisitions. Dans ce sens cette étude démontre que le style d'intégration a un impact relevant sur la création de valeur des acquisitions.

Mots clés: acquisitions, exploitation, centralisation, formalisation, socialisation, style d'intégration.

One of the main motivations of acquisitions is knowledge exploitation or the transference of knowledge between the acquirer firm and the acquired firm. In the last years, strategy research has related knowledge exploitation in acquisitions with the likelihood of value creation (Porter, 1987; Haspeslagh and Jemison, 1991; Bower, 2001; Ranft and Lord, 2002; Zollo and Singh, 2004). The majority of the studies analyze the transfer of technological knowledge between the R+D units of the acquired and acquiring firms (Håkanson, 1995; Bresman, Birkinshaw and Nobel, 1999; Birkinshaw, Bresman and Håkanson, 2000; Frost, Birkinshaw and Ensign, 2002; Schweizer, 2005).

However, while strategic research has made this first step relating knowledge exploitation, specifically technological knowledge, with value creation in acquisitions, it has only partially developed which integration variables explain the level of knowledge exploitation. In other words, it has not answer the question of which the determinants of knowledge exploitation are. For analyzing the determinants of knowledge exploitation in acquisitions we combine the advances of the knowledge based view with the acquisition process perspective. In this sense, the knowledge based view allows us to anticipate that the efficiency of knowledge exploitation processes is based on specific determinants, as it is proposed for strategic alliances (Grant and Baden-Fuller, 2004). On the other hand, process perspective points out the main role of acquisition integration on value creation and, therefore, on knowledge exploitation. Additionally, using both perspectives implies balancing the role of the architecture of the acquirer-acquired relationships with the psychological side of the relationship, a more soft side that has not been analyzed in the literature about knowledge exploitation in acquisitions.

In that sense, the research about acquisitions integration focuses mainly in analyzing some specific structural conditions that allow knowledge exploitation. Specifically, it analyzes the role of some organizational design choices as centralization or, in other cases, the role of socialization in knowledge transfer (Ranft and Lord, 2002; Zollo and Singh, 2004). But, at the moment, there is not a complete view of the relationship between knowledge exploitation and the architecture or the structural side of this inter-intra organizational relationship (Ranft and Lord, 2002). Moreover, we propose that while the literature has focused its attention into the role of one to one structural choices for knowledge exploitation it has not studied the whole design of the new firm and it has not directed its attention to the psychological side of the relationships.

In respect to the psychological¹ side, we propose that integration differ in the degree of dominance versus openness, change or innovation of the relationship between the acquirer and acquired firm. The structural integration can be a process dominated by the acquirer firm. In other cases, the structural integration involves a high degree of innovation and change in the acquirer and the acquired firm. In this later case, there are strong levels of structural integration and a clear architecture is defined but it is done with a style that implies an inter-organizational relationship based on an innovative, openness and not dominant style.

In summary the aim of this paper is to analyze the structural and psychological dimensions of acquisition integration for knowledge exploitation. With this aim in the next section we develop a model of knowledge exploitation in acquisitions and then using data from 45 Spanish acquisitions made from 2000 until 2006 and using partial least square techniques we demonstrate that acquisitions integration process for knowledge exploitation relies on high levels of integration. This integration demands centralization, socialization and formalization between the acquirer firm and the acquired firm. However, the acquisition value creation is better explained when we added the psychology of the integration relationships to the architecture of the acquisition integration relationships. In that sense, our study demonstrates that the style of integration has a relevant impact on the acquisition value creation.

1. THEORETICAL BACKGROUND

According to March (1991) exploitation includes such things as refinement, choice, efficiency, selection, implementation or execution.

Relaying on the knowledge-based view, Grant and Baden-Fuller (2004) propose, for strategic alliances, that knowledge exploitation processes versus knowledge exploration processes have specific determinants. In the acquisitions literature some main determinants for knowledge exploitation were developed by the process perspective defining that the integration stage is key for understanding acquisition's value creation. In this line some works have tried to define some managerial choices about how acquisition integration can impact knowledge exploitation. Ranft and Lord (2002), in technological acquisitions, analyze using grounded theory the role of autonomy for

¹ In this study we consider the psychological side of the relationships with the aim of opposing it to the structural side -architecture- of the acquired-acquirer relationships. Nevertheless, we think that the integration style, as it is considered here, is only a partial aspect of the psychology.

knowledge transference between the acquirer and acquired firms. Zollo and Singh (2004) demonstrate the impact of autonomy for knowledge transfer in acquisitions. While autonomy versus centralization has been analyzed in a deep way, others have tried to show the role of other coordination mechanisms. That is the case of Birkinshaw *et al.* (2000) that analyze the role of socialization in knowledge transfer between R&D multinationals. However, while those studies advanced in the role of a particular management choice, organizational designers propose those choices as a set of coordination mechanisms that implies a richer view of how knowledge can be coordinate and transferred inside firms or between firms. Moreover, those coordination mechanisms have relations and trade-offs. From this point of view, and as Schweiger (2005) points out, there is a need of more complete views of acquisition integration choices. So, we propose that structural choices about centralization, formalization and socialization will be central determinants for understanding knowledge transfer in acquisitions. We will develop these coordination mechanisms under the label of the design side or the architecture of acquisition integration.

On the other hand, some knowledge-based view studies point out the role of human resources dimensions for understanding knowledge transference. Szulanski (1996) analyzes the relevance of motivation in the decision to transfer. Desire and motivation must be built for exploiting knowledge between units (Szulanski 1996; Szulanski and Jensen 2004; Szulanski, Cappetta and Jensen 2004). However, recent studies highlight that the willingness and the motivation to transfer is not always great (Empson 2001; Husted and Michaivola 2002; Szulanski and Jensen 2004). In the case of acquisitions knowledge exploitation needs to break down fears, specifically the fear of being contaminated by the other firm's reputation as well as the fear of being exploited by the other firm (Empson 2001). We will develop this human side under the label of the motivational side or the psychological side of acquisition integration.

In the acquisition integration literature Shrivastava (1986) was pioneer in looking to those different sides of integration. He developed the idea of a procedural and physical integration in one side and a human side of integration. Years later, Larsson and Finkelstein (1999) demonstrate the relevance of the human side and the integration choices for explaining value creation. However, those two sides of acquisitions integration, the architectural and the psychological sides, had not been integrated before for analyzing knowledge transfer in acquisitions.

1.1. THE ARCHITECTURE OF ACQUISITIONS INTEGRATION: THE ROLE OF CENTRALIZATION, FORMALIZATION AND SOCIALIZATION.

1.1.1. Centralization and knowledge exploitation in acquisitions

Centralization and decentralization are two extremes of a continuum that refers to the place where the power of decision is located in an organization. For Mintzberg (1979), centralization is the most exact mechanism for decision-making in an organization and, in this sense, cases where the power to make decisions is delegated must be justified. Decentralization is justified by the need for flexibility and the ability to react on the part of units when faced with changes in their working environment and the need to stimulate creativity and motivation of particular members of the organization.

The level of centralization has also been associated with some positive aspects. Centralization has been recommended for questions such as the reconfiguration of resources (Capron and Mitchell, 1998) or the transfer of knowledge (Haspeslagh and Jemison, 1991; Ranft and Lord, 2002; Puranam, Singh and Zollo, 2003; Paruchuri, Nerkar and Hambrick, 2006). Centralization is thus considered to be positive for the transfer of capabilities between the acquired and acquiring firms.

In the field of mergers and acquisitions, several studies exist that analyze the role of centralization. Calori, Lubatkin and Very (1994, 1996) consider centralization as one of the dimensions that allows for the description of post-acquisition integration. They see it as the sharing out of the power to make decisions between the acquiring and acquired firm and the transfer of managers to the acquired firm which shifts decision-making power over to the buyer. They also use the term autonomy as a synonym of decentralization, i.e. the separation of decision-making power between the acquired and acquiring firms in such a way that the latter has the freedom to make decisions.

In the post-acquisition integration process, centralization is the coordination mechanism that has hitherto received the greatest attention from researchers, being the most strategic and least reversible. It implies a formal choice on design between preservation and absorption and thus this decision should precede that of any other coordination mechanism (Puranam, Singh and Zollo, 2006).

With regard to the role of centralization in knowledge exploitation, knowledge transfer requires individuals to share the knowledge they possess. Applying the argument put forward by Ghosal and Bartlett (1988) in their study on the context of multi-national

firms, in order to exploit innovations, it is necessary to centralize, as autonomy does not allow for knowledge transfer.

The existence of a certain degree of centralization makes it possible to lead the process towards some common objectives aimed at inducing acquired and acquiring firms to share knowledge. If both firms are managed autonomously and independently, they run the risk of isolating their knowledge, thereby hindering transfer and learning due to the boundaries that hamper the flow of knowledge.

Birkinshaw, Nobel and Ridderstrale (2002), state that an essential aspect in the post-acquisition integration process lies in the integration of tasks that make value creation possible, measured in terms of the transfer of capabilities. The integration of tasks requires managerial actions related to the combination and elimination of operations and, therefore, with coordination through centralization. Along the same lines, Puranam *et al.*, (2006) claim that acquiring firms should integrate acquired firms in order to exploit their capabilities and technology in a coordinated way. Siggelkow and Levinthal (2003) state that refinement and exploitation are achieved through centralization.

We can therefore propose that:

Hypothesis 1: The greater the level of centralization in acquisitions, the greater the level of knowledge exploitation

1.1.2. Formalization and exploitation of knowledge in acquisitions

According to Pugh, Hickson, Hinings and Turner (1968), formalization refers to the degree to which rules, procedures, instructions and communication are set down in written documents. For Mintzberg (1979), formalization allows for the behaviour of an organization's members to be managed indirectly and is based on procedures and rules with a view to channelling and supervising in activities. An organization's tasks and work flows can thus be controlled and can even predict and control the behaviour of members, thereby avoiding any arbitrariness.

Within the framework of mergers and acquisitions, very little research includes the study of formalization. Those that have done so have analyzed formalization as a formal control system of the post-acquisition integration process. Shrivastava (1986) considers formalization to be the cornerstone of one of the three areas of integration he proposes; that of the integration of procedures. From this perspective, formalization contributes to increasing the level of integration between the firms involved by combining the systems and procedures of the merged firms at an operative level, in management control and in

strategic planning. The objective of such integration is to homogenize and standardize the working procedures of the acquired and acquiring firms in order to facilitate communication, improve productivity and reduce the cost of processing information.

Ranft and Lord (2002) claim that differences in systems and practices can lead to dysfunctional conflicts between the acquired and acquiring firms and employees from both sides may not be productive when they work together due to the different norms and procedures (Jemison and Sitkin, 1986; Nahavandi and Malekzadeh, 1988; Chatterjee, Lubatkin, Schweizer and Weber, 1992). Papadakis (2005) claims that, a greater formalization of the process of decision-making in the acquired firm, allows a more successful implementation of the merger or acquisition, due to a reduction in ambiguity and uncertainty. According to Calori *et al.*, (1994), formalization is an attempt to indirectly control the behaviour of the firm's members through procedures and documents with a view to limiting their discretionary powers and directing their activities.

Taking the study by Ghoshal and Nohria (1989) on multinational firms and that of Calori *et al.*, (1994) as references, we see formalization as a mechanism that restricts the freedom of action both of the acquiring firm and the acquired one due to the fact that it reduces part of their relations to the application of a series of regulations.

Knowledge exploitation in an acquisition requires a mutual approximation of the acquired and acquiring firms. Formalization allows the work procedures of both firms to become homogeneous and standardized (Shrisvastava, 1986). This process of homogeneity and the establishment of norms bring the firms members closer together as they are all subject to the same standards, which in turn enable knowledge transfer. By establishing and specifying behaviour guidelines, the employees of the buyer and acquired organizations have a previous knowledge of what is expected of them and this may reduce uncertainty and promote stability, fundamental characteristics for enabling knowledge exploitation (Ranft and Lord, 2002)

We therefore propose that:

Hypothesis 2: The greater the level of formalization in the acquisition, the greater the level of knowledge exploitation

1.1.3. Socialization and knowledge exploitation in acquisitions

Socialization is a means of management by which individuals internalize a set of beliefs or behaviour expectations; it is fundamentally based on informal communication

(Edström and Galbraith, 1977; Ouchi, 1980) and on personal involvement (Shrivastava, 1986). In the case of acquisitions, each of the firms possesses a different culture, value system and different beliefs shared by those from one firm, as well as a series of their own socialization mechanisms. After an acquisition, firms lack common socialization mechanisms that allow them to interact and share their experience. These socialization mechanisms are those that can generate a new social context from which the expected value of the acquisition can be drawn.

The use of socialization as a coordination mechanism between the acquired and acquiring firm implies a certain level of social integration between the members of both firms. This level depends on the amount of formal communication with respect to the informal one, as well as on the frequency and richness of such a communication between firms (Calori *et al.*, 1996; Bresman *et al.*, 1999; Birkinshaw *et al.*, 2000; Ranft and Lord, 2002; Graebner, 2004).

Calori *et al.*, (1996) measure socialization processes used by the acquiring firm in terms of attempts at communication and personal involvement. When we talk about communication, we refer to the degree to which information is exchanged between the acquired and acquiring firms. Communication is a fundamental dimension of the implementation of acquisitions (Ranft and Lord, 2002). In fact some authors such as Papadakis (2005) found that the existence of a communication program in the firm is one of the factors that had the greatest effect on the success of implementation in mergers and acquisitions. Communication plays a significant role as a means of reducing uncertainty and for creating what Ranft and Lord (2002) called “shared understanding” with the acquired firm, creating a more favourable climate and helping to protect valuable and potentially fragile knowledge (Von Krog, 1998). Therefore, communication facilitates coordination for managers and it serves as a basis for the crossover of knowledge and for activities between both firms by creating trust between key personnel and developing a feeling of a shared goal. Communication becomes a fundamental variable, particularly if we bear in mind that knowledge exists in individuals, routines and organizational culture. Studies on acquisitions have discussed different forms of communication: the creation of teams with managers from the buyer and the acquired firm, frequent face-to-face meetings between staff from both firms and frequent visits from managers from the acquiring firm to the installations it has bought, as well as interviews and informal conversations.

Aside from attempts at communication, the socialization process can also be accompanied by personal involvement. The efficiency of communication processes (the quality of the atmosphere and the communication that takes place in the acquisition) is related to the expected commitment and employee identification with the firm, which can lead to greater motivation among the employees of the acquired firm (Bartels, Douwes, De Jong and Pruyn, 2006; Van Dick, Ullrich and Tissington, 2006). In this sense, Haspeslagh and Jemison (1991) claim that the involvement of implementers is an essential element for achieving a conducive climate that enables the transfer of capabilities.

Kogut and Zander (1992) consider firms as social communities that are specialized in the internal transfer of knowledge, in so far as, in social communities, individuals relate to each other, interact and communicate. In the case of mergers and acquisitions, knowledge transfer takes place both within and between the firms involved and this interaction and communication are key parts of this process. After the acquisition, rich, fluid communication is fundamental for promoting trust and for generating common understanding (and therefore retaining key staff) and for transferring knowledge within the structural limits created by the acquisition.

Miller, Zhao and Calantone (2006) stress the fact that personal interaction in organizations is critical for knowledge transfer. Studies on technological acquisitions relate the frequency, richness and personal nature of communication with the creation of a social context and with knowledge transfer in acquisitions (Håkanson, 1995; Bresman *et al.*, 1999; Birkinshaw *et al.*, 2000). It can be concluded from the outcomes of these studies that the creation of a new social context, necessary for the exploitation of knowledge, is associated with the richness and frequency of informal and formal communication between the buyer and the acquired firm.

We therefore propose that:

Hypothesis 3: The greater the level of socialization in the acquisition, the greater the level of knowledge exploitation

1.2. THE PSYCHOLOGY OF ACQUISITIONS INTEGRATION: THE ROLE OF INTEGRATION STYLE

The organizational design side explains the architecture that supports knowledge transference between the acquirer and the acquired firm. But knowledge transference is based not only in physical systems and procedures but also in human resources. In that

sense knowledge-based view defends that motivation for transference and for receiving are key elements for the success of the process (Szulanski, 1996).

In acquisitions literature this motivational side of integration is linked to the style of relation between the acquirer managers and the acquired ones. In 1986, Jemison and Sitkin were pioneer on stressing that the managers of the acquirer firm tend to feel superior to those of the acquired firm and this style and attitude of dominance and superiority impact the value creation at the integration stage.

From then until now other researches have link the individual and collective reactions after the acquisitions with some consequences that reduce the likelihood of value creation. It has been linked to the likelihood of employees' retention and its impact on value creation (Coff, 1997; Ranft and Lord, 2000; 2002), to the fear of exploitation and the increase of impediments to knowledge transfer in professional firms (Empson, 2001), to the managers' cognitive bias who not consider relevant the integration phase and make difficult the transfer of knowledge (Barabel and Meier, 2002). Some papers dedicated to external symbiotic growth (Haspeslagh and Jemison, 1991; Herriau and Meier, 2001; Koenig and Meier, 2001) establish that in this type of operation, it is important to leave room for emergences and initiatives, especially in the acquired firm. The main reason for this is to avoid the risk of the acquiring firm dominating the acquired firm and preventing it from making any valuable contribution to the joint project.

In this same line, Zaheer, Schoemaker and Genc (2003) propose that, for understanding integration difficulties, it is not only the expectation that *how* things are done would change but the question of *who* would lead the change – the acquirer firm or the acquired one. In other words, they point out that the style of integration appears to be particularly salient to employees and their reactions to integration.

The notion of this motivational side is present in some sense in certain studies but is not as well defined as it is the organizational design side. In that sense there are studies that focus their attention on the role of cross responsibilities and shared governance in the acquisition process (Coff 1997; 1999; Graebner 2004) showing that the style of integration or how integration is lead is a key issue. Others called for a composition of the new management team that should reflect the acquirer's intention in terms of integration and expertise transfer (Hébert, Very and Beamish, 2005). Some case studies on technological acquisitions reported the role of the top management team

composition as well as the structural position given to the acquired firm (Bresman *et al.* 1999; Birkinshaw *et al.* 2000; Ranft and Lord 2002) for knowledge transference.

In some studies it is called the style of integration and does not refer to *how much integration is achieved* but to *how it is done* (Iborra and Dolz 2005; 2006). It allows recognition between dominant processes of integration and non-dominant ones. Dominant processes are those ones where all the systems and procedures are integrated using the acquirer firm's way of doing things. They imply a win-no win relationship. Non-dominant processes are defined as those processes that are characterized at least by some level of cross-responsibility for the acquired managers or some shared governance. To a certain extent, they imply a win-win relationship. In the international context of acquisitions the balance in the top management team between expatriate managers (or acquirer managers) and local managers (or acquired managers) is related to the survival of the acquisition (Hébert *et al.* 2005). They focus their attention into the top management team composition evaluating the choice between acquirer managers, acquired ones or a mixed composition because this team bridges and organizes flows of knowledge between acquirer and acquired companies. Graebner (2004) places its focus not in how much or how quickly integration is achieved but to who is in front of the changes. She highlights that the value creation will be higher when changes are fostered by the acquired managers. She also highlights the role of status of the acquired firm.

So, integration style has to do with *how the integration is carried out*. When firms integrate their functions, systems and procedures, to a large extent they can use different styles to achieve their objectives. Sometimes a dominant style is used where all the functions and systems are integrated using the acquirer firm's own policies, procedures and systems, but at other times the choice is a non-dominant style. In the latter case, for some systems and functional activities, the integrated unit uses the policies and procedures of the acquired firm, for others, those of the acquirer firm are used and in some cases, a new policy is created using neither those of the acquirer nor of the acquired firm (Iborra and Dolz 2005, 2006).

Integration style has some relevant consequences for the acquisition integration success because it has been related to the level of turnover challenge (Hambrick and Cannella 1993; Lubatkin, Schweiger, and Weber 1999; Ranft and Lord 2000) as well as to the level of motivation. The strong link found by Cannella and Hambrick (1993) between status bestowal and acquisition performance was discussed in terms of the motivation effect on top management promotion in the acquired firm.

In that sense we can expect that a non-dominant integration style on the part of the acquirer will increase the positive reactions of acquired employees in terms of motivation and retention and, therefore, can increase value creation.

We therefore propose that:

Hypothesis 4: The more dominant the style of the acquisition integration the lower the level of value creation in the acquisition

The attitudes of superiority towards the managers and professional and technical employees of the acquired firm are on the base of the relative standing theory. Those works link the level of centralization in the acquired firm with the perception of domination about the choice of integration (Hambrick and Cannella, 1993; Lubatkin *et al.* 1999). In these studies, the status of the acquired firm is related to the removal on the level of autonomy.

We therefore propose that:

Hypothesis 5: The greater the level of centralization in the acquisition, the more dominant the style of the acquisition integration

1.3. CREATING VALUE BY KNOWLEDGE EXPLOITATION

The creation of value in acquisitions through the use and transfer of knowledge between acquired and acquiring firms has been the objective of numerous acquisitions (Porter, 1987; Haspeslagh and Jemison, 1991; Bower, 2001; Ranft and Lord, 2002; Zollo and Singh, 2004). In some cases, firms create value when one of them improves its capabilities by acquiring functional skills that have been transferred from another firm in order to become more competitive (Capron, Dussauge and Mitchell, 1998; Capron and Mitchell, 1998; Zollo and Singh, 2004). Cases can be found where the acquiring firm frequently applies its knowledge of marketing, manufacturing, logistics or knowledge related to planning, control or information systems to improve the activities of the acquired firm (Iborra and Dolz, 2005).

On occasions, technological knowledge can also be transferred through acquisitions. In fact, obtaining the technology and capabilities owned by acquired firms was one of the main reasons for the increase in its relative importance in the waves of acquisitions in the previous decade (Ahuja and Katila, 2001; Bower, 2001). As a result, several studies have appeared based on the acquisition of new technologies from other firms (Håkanson, 1995; Bresman *et al.*, 1999; Birkinshaw *et al.*, 2000; Frost, *et al.*, 2002; Schweizer, 2005), the majority of which analyze the transfer of technological

knowledge between the R+D units of the acquired and acquiring firms. Value creation occurs when technological knowledge is transferred from one unit to another. According to Ranft and Lord (2002), knowledge transfer is reached when buyers take possession of the technologies and capabilities of a target firm and apply them to commercial ends.

Acquisitions can even act as a tool for transferring managerial skills. This occurs when a firm can make another become more competitive by improving the range and depth of its general managerial skills (Haspeslagh and Jemison, 1991). These capabilities go from the wide-reaching skills needed for establishing business management and leadership to more analytically oriented ones, such as those necessary for strategic and financial planning, control or even human resources management.

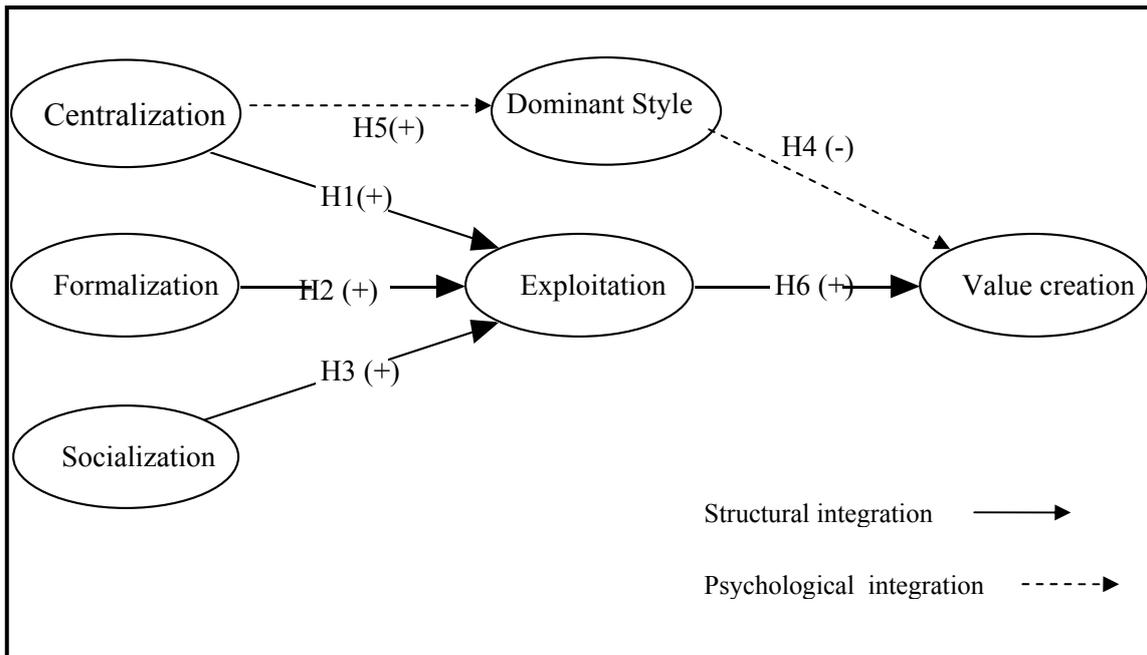
At the same time, the local search (Rosenkopf and Nerkar, 2001) allows firms to create an increasing number of innovations and thus exploit knowledge. In the case of acquisitions, this local search occurs by applying knowledge and know-how from one of the firms involved to the other. Moreover, throughout the literature, acquisitions have been considered as important options for reorganizing the resources of firms and assigning them to more productive uses (Anand and Singh, 1997; Capron *et al.*, 1998; Capron and Mitchell, 1998). Via acquisitions, specific resources possessed by a firm can be merged with the resources of another with a view to improving the productivity of those combined resources (Haspeslagh and Jemison, 1991; Anand and Singh, 1997). Specific knowledge owned by acquired and acquiring firms can therefore be combined and applied with the idea of achieving greater efficiency. In order to do so, the knowledge to be reassigned must be transferred from the context it is housed in to the context that will be used to exploit it, and thus contribute to value creation.

We can thus formulate the following hypothesis:

Hypothesis 6: The higher the level of knowledge exploitation in the acquisition, the greater the level of value creation

Figure 1 represents our theoretical model

Figure 1. The integration model for knowledge exploitation



2. METHODS AND DATA

2.1. SAMPLE AND DATA

The population used for the study is made up of all those Spanish firms that merged or were acquired between 2000 and 2006 that appear in the Thomson One Banker (2005) database. Only one questionnaire was sent for each firm, so multiple acquirers were only surveyed once. Also anonymous financial investors were deleted, along with firms without complete identification data. These criteria left us with 716 cases. A postal survey was sent to each firm. The questionnaires were sent to top-level managers from the firms. Table 1 describes the population and the sample. Forty-five questionnaires were finally received.

Table 1. Survey characteristics

Universe	716 Spanish firms that took part in a full acquisition from 2000 to 2006.
Sample size	45 acquisitions
Confidence level	95%
Error	14.5%
Time	January-April 2007
Extent	National (Spain)
Sampling unit	Company
Survey technique	Structured questionnaire to the CEO of the acquiring or acquired firm who were involved in acquisition

Acquiring firms of the sample had experience in 80% of the cases, and more than half had international acquisition experience. They belong to a unique industry in 51.2% of the cases. The industry distribution was similar to other studies of Spanish acquisitions

with a prevalence of the service industry (Mascareñas and Izquierdo, 2000). Small and medium sized firms represent 27.5 of the acquiring firms and 62.5% of the acquired firms.

2.2. MEASURES

Centralization. It is based in the union of different policies, processes or systems of the acquired and acquiring firms. We measure centralization degree by a two item scale. Using a five-point scales (1= none; 5= all) the survey asked (1) how many policies regarding to value chain were centralized and (2) how many systems (information, planning and control) of both firms were integrated.

This scale is based on Zollo and Singh (2004), Iborra and Dolz (2006) and Paruchuri *et al.* (2006). Zollo and Singh (2004) use a unique scale that answer to the question about how many systems, procedures and products were align or centralized. Iborra and Dolz (2006) use a scale of seven items that measure how many functional areas and systems were integrated, based on the main activities of value chain by Porter (1985) and some activities and support systems. Paruchuri *et al.* (2006) use a similar measure but at functional level, that is, they base on the integration of activities the R+D units of the acquired and acquiring firms.

Formalization. It is measured with a scale of 6 items using a 5-point scales (1= totally disagree; 5= totally agree) that reflects the use of procedures and rules with the aim of directing and controlling activities and indirectly controlling the behavior of individuals. The basis for this measure comes from two sources. On the one hand, following Calori *et al.* (1996), we include three items in which we asked respondents to evaluate at what level they have adopted the following elements from the acquiring firm (1) the planning system, (2) the procedures of financial control and budgeting control and (3) the accountability systems. Those variables are related to the procedure integration defined by Shrivastava (1986) and to what Prahalad and Doz (1987) called “data management”. On the other hand, based on Papadakis (2005), we incorporate the degree of formalization in decision-making, specifically in conflict-solving using a scale of three items that shows if they: (4) establish rules or procedures to deal with problems (5) apply procedures to solve problems and (6) appoint people to solve problems.

Socialization. It reflects the use of a set of informal social activities by which the members of an organization internalize a set of beliefs and behavior norms. The most relevant of these are communication and personal involvement. Socialization has been

measured by the level of communication between members, by informal meetings, working teams and the cross visits between management teams (Daft and Lengel, 1986; Bresman *et al.*, 1999; Birkinshaw *et al.*, 2000; Larsson and Lubatkin, 2001; Ranft and Lord, 2002). Based on Calori *et al.* (1996), the informal processes of socialization are measured using five items on a 5-point Likert scale (1= totally disagree; 5= totally agree) that show acquiring managers' personal effort after one year. The items are: (1) they contribute to a successful relationship between both firms, (2) they motivate internal cooperation between both firms, (3) they promote communication between the employees of both firms, (4) they encourage teamwork between both firms (5) they interview or have conversations at least twice a week with acquired managers. This last item has been adapted from Bartlett and Ghoshal (1988), in order to measure communication frequency.

Exploitation. The literature has developed different measures of exploitation. It has been measured in terms of the novelty of the innovation (Bierly and Chakrabarti, 1996), by the scope and deepness of the patents (Katila and Ahuja, 2002), by the grade in which the behavior is crossing the organizational and technological frontiers (Rosenkopf and Nerkar, 2001) or inclusive by the novelty of the projects. In these cases exploitation and exploration are two extremes of a single scale. On the other hand, He and Wong (2004) developed a scale that considers exploitation and exploration as two different dimensions of learning behavior. Following this approximation our exploitation scale is based on Lubatkin, Simsek, Ling and Veiga (2006) which is rooted on the initial scale of He and Wong (2004) and Benner and Tushman (2003). The measure includes 6 items in which managers are asked about the orientation of the combined firm. Using a Likert 5-point scale (1= total disagree to 5= totally agree) the survey asked to what degree the combined firm: (1) commits to improve quality and lower cost (2) constantly surveys existing customers' satisfaction (3) continuously improves the reliability of its products and services (4) adapts the offer to maintain customer satisfied (5) increases the level of automation in its operations (6) penetrates more deeply into its existing customers base.

Dominant Style. We measure dominant style using ten items that represent the following functional areas and systems: purchase, human resources, production, marketing, R+D, logistics, finance, information systems, planning, and control systems (Haspeslagh and Jemison, 1991; Iborra and Dolz, 2006). Dominant style reflects the dominant degree used by the acquirer firm in leading change. We used a 4-point scale in

which 1= we adopted the policies of the acquired firm, 2= we maintain both functional policies independents, 3= we have created a new policy 4= we adopt the policies of the acquirer firm.

Value Creation. There are different perspectives for analyzing value creation in acquisitions. While some studies develop measures aimed at the synergies in acquisitions (Larsson and Finkelstein, 1999) that can be very useful for comparing intra-industrial acquisition performance, other researchers use more standard measures. Calori *et al.* (1994) developed a three-item scale based on the economic performance of the acquisitions. The three items are related to three main indicators of firm performance: market share, profits and revenues. So, in this study, following Calori *et al.* (1994) we asked managers to compare the combined firm performance two years after the acquisition with its level before acquisition. Specifically the three items asked for (1) profits after acquisitions, (2) sales after acquisition and (3) market share after acquisition. Each item was evaluated in a five point scale from (1) much lower to (5) much higher.

2.3. ESTIMATION METHOD

Developed by Wold (1975), Partial Least Square models (PLS) is a component-based SEM technique that has been gaining interest and use among management researchers in recent years² because of its ability to model latent constructs under conditions of non-normality and, as in this paper, small to medium sample sizes (Fornell, 1982; Barclay, Higgings and Thompson, 1995; Hulland, 1999; Haenlien and Kaplan, 2004). Unlike CBSEM, PLS estimation does not involve a statistical model and thus avoids the need for assumptions about scales of measurement (Fornell and Bookstein, 1982). As pointed out by Johansson and Yip (1994), as each causal subsystem sequence of paths is estimated separately very small sample sizes³ can be accepted.

Accordingly to Anderson and Gerbing (1988) and Gerbing and Anderson's (1988) two-step approach, the measurement model is first developed and evaluated separately from the full structural equation model. The evaluation of the measurement model implies analyzing (1) reliability, (2) convergent validity and (3) discriminant validity of the

² While less known than other SEM methods, PLS has been used in strategic management research in top management journals (Cool, Dierickx and Jemison, 1989; Fornell, Lorange and Ross, 1990; Johansson and Yip, 1994; Birkinshaw, Morrison and Hulland, 1995; Staples, Hulland and Higgins, 1999; Robins, Tallman and Fladmoe-Lindquist, 2002; Tsang, 2002; Gray and Meister, 2004). A review of its use in strategic management can be found at Hulland (1999).

³ The minimum sample size is fixed by the more complex formative construct or by the number of variables of the more complex path relation (Barclay *et al.*, 1995)

constructs. In this study, SmartPLS 2.0 (Ringle, Wende and Will, 2005) was used for the estimations.

Table 2. Validation of the measurement instrument: reliability and convergent validity

Factor	Indicator	Loading	t-statistic* (Bootstrap)	Average loadings	Composite reliability	Cronbach's Alpha	Average variance extracted (AVE)
Centralization	CENT1	.91	47.87	.92	.91	.81	.84
	CENT2	.92	39.65				
Formalization	FORM1	.86	7.18	.87	.94	.92	.76
	FORM2	.91	8.12				
	FORM3	.89	7.85				
	FORM5	.90	13.30				
	FORM6	.81	7.09				
Socialization	SOC1	.89	22.71	.86	.94	.92	.75
	SOC2	.92	18.36				
	SOC3	.88	16.06				
	SOC4	.82	10.79				
	SOC5	.81	11.71				
Exploitation	EXPLT1	.72	13.33	.77	.85	.77	.59
	EXPLT2	.76	13.76				
	EXPLT3	.83	14.34				
	EXPLT5	.76	14.53				
Dominant Style	DS1	.73	8.28	.75	.91	.89	.57
	DS2	.64	13.48				
	DS5	.75	10.83				
	DS6	.79	13.93				
	DS7	.74	7.94				
	DS8	.75	10.15				
	DS9	.81	16.03				
	DS10	.84	14.92				
Value Creation	VC2	.84	3.76	0.91	.91	.82	.83
	VC3	.98	1.94				

*All t values are significant ($p < .05$)

Reliability of the scales. Table 2 demonstrates the high internal consistency of the constructs. In each case, Cronbach's alpha exceeded Nunnally and Bernstein's (1994) recommendation of .70. Composite reliability represents the shared variance among a set of observed variables measuring an underlying construct (Fornell and Larcker, 1981). Generally, a composite reliability of at least .60 is considered desirable (Bagozzi and Yi, 1988). This requirement is met for every factor. Average variance extracted (AVE) was also calculated for each construct, resulting in AVEs greater than .50 (Fornell and Larcker, 1981). In the case of exploitation, EXPLT4 and EXPLT6 were dropped. Also, the final scale of a dominant style was made up with 8-items instead of ten and DS3 and DS4 were dropped. In all cases we dropped factors due to having a factorial loading of lower than 0.7 and an average value of the items of lower than 0.7.

Convergent validity. The significance of the loadings was determined with a bootstrap re-sampling procedure (500 sub-samples of the original sample size) to obtain the *t-statistic value*. As evidence of convergent validity results in table 2 indicate that all items are significantly ($p < .05$) related to their hypothesized factors, and the size of all the standardized loadings are higher than .60 (Bagozzi and Yi, 1988) and the average of the item-to-factor loadings are higher than .70 (Hair, Anderson, Tatham and Black, 1998). Some items were dropped from the original model. In the case of formalization from the original 6 item scale FORM4 was dropped due to it was not significant at $p < 0.05$ and the same can be said about VC1 that was dropped in the 3-item sale of value creation.

Discriminant validity. Evidence should be provided that the scale for one construct varies for a different, yet related factor's measure. Discriminant validity for those two factors is established if the AVE for two factors is greater than the square of the correlation between them (Fornell and Larcker, 1981). Results in Table 3 indicate a satisfactory level of discriminant validity.

On the basis of these criteria, we concluded that the measures in the study provided sufficient evidence of reliability, and convergent and discriminant validity.

Table 3. Validation of the measurement instrument: discriminant validity.

	Centralization	Formalization	Socialization	Exploitation	Dominant Style	Value Creation
Centralization	.92					
Formalization	.64	.87				
Socialization	-.01	.01	.87			
Exploitation	.34	.37	.61	.77		
Dominant Style	.74	.65	-.01	.23	.76	
Value creation	.01	-.01	.17	.16	-.19	.91

*The lower triangle shows correlations and the diagonal square roots of average variance extracted

3. RESULTS

The PLS estimation of the structural model is reported in table 4. As in the measurement model evaluation, the significance of the path estimates was tested using a bootstrap approach (Chin, 1998) of 500 sub-samples. The explanatory capacity of the model was assessed by looking at the R^2 value (variance accounted for) in the dependent constructs (exploitation, dominant style and value creation). The model explained 53% of the variance in exploitation, 55% in dominant style and 8% in value creation.

Table 4. Path estimates and variance explained for the structural model

Hypothesis	Description	standardized β *	t-statistic (Bootstrap)	Explained Variance (R^2)
H1	Centralization→Exploitation	.19	3.39	.53
H2	Formalization→Exploitation	.25	4.03	
H3	Socialization→Exploitation	.61	14.18	
H4	Dominant style→Value Creation	-.23	3.43	.08
H5	Centralization → Dominant style	.74	22.79	.55
H6	Exploitation→Value Creation	.21	3.21	.08

*All values are significant ($p < .01$)

With regard to the integration processes that enable knowledge exploitation, the results confirm the positive and significant role played by centralization ($\beta = 0.19$, $p < .01$), which means that H1 is contrasted. So, as we expected, the higher the centralization level between acquired and acquirer firm the greater the knowledge exploitation in the combined firm.

As we proposed in H2, formalization is positively and significantly associated with knowledge exploitation ($\beta = 0.25$, $p > .01$), and so the hypothesis that greater levels of formalization generate greater levels of knowledge transfer is thus contrasted.

As well, as we proposed in H3, socialization is positively associated with knowledge exploitation. The value of the standardized β between socialization and knowledge exploitation ($\beta = 0.61$, $p < .01$) indicates the central role played by socialization in knowledge transfer between the acquired and acquiring firms.

In respect to the psychological side, the results confirm the negative and significant role played by dominant style ($\beta = -0.23$, $p < .01$), which means that H4 is contrasted. Therefore, as we expected, the more dominant the style of the acquisition integration the lower the level of value creation in the acquisition.

Also, the role of centralization reinforcing a dominant style is clear. As we proposed in H5, centralization is positively and significantly associated with the degree of dominant style ($\beta = 0.74$, $p < .01$), and so the hypothesis that the greater level of centralization in the acquisition the more dominant the style of the acquisition integration.

Finally, and as stated in H6, our results confirm that the greater the level of knowledge exploitation in the acquisition the greater the level of acquisition's value creation ($\beta = 0.21$, $p < .01$).

4. DISCUSSION AND CONCLUSION

This research reflects the complexity inherent in the process of integration in acquisitions and shows the role played by the exploitation of knowledge in this process and states the importance of managerial decisions related to integration on the outcome of this type of operations.

Our study is rooted in some of the advances developed within the knowledge-based view, considering knowledge as a strategic resource and firms as bodies that possess and promote the creation and development of specialized skills and knowledge. From this perspective, we state that acquisitions have become an alternative in order, for the firms involved, to exploiting knowledge. In this research, we confirm that the exploitation of knowledge is a source of value creation in acquisitions in line with acquisition literature.

However, our study provides a wider vision of knowledge exploitation as a source of value creation in acquisitions. Earlier studies are limited to the field of the study of technological acquisitions. Thus, on the one hand, it broadens the field of study by considering acquisitions in different sectors, not only of technological firms. On the other, it incorporates a novel vision of exploitation. Previous studies have considered exploitation as a process of knowledge transfer possessed by acquired and acquiring firms with regard to functions, technology or managerial skills. Our measurement of exploitation is thus richer, as it also implies a better way of doing things in firms involved in acquisitions whether it be with respect to quality, customers or products and services.

We linked the advances of the knowledge-based view with the process perspective which emphasizes the post-acquisition period during which the process of integration takes place. In this sense, we base our study on the idea that the potential value of acquisitions is created or destroyed during the process of integration, considering it necessary to understand the determinants of this process and its chief consequences. In this sense, the literature on the processes of integration has been typically fragmented and has tended to make only partial proposals. Studies on this topic have focused on analyzing the role of one coordination mechanism or have restricted the study to a particular sector of firms –as in the case of technological acquisitions– or a particular unit of the firm –such as the integration of R+D units (Bresman *et al.*, 1999; Birkinshaw

et al., 2000; Bower, 2001; Ranft and Lord, 2002; Zollo and Singh, 2004; Miller *et al.* 2006).

In this research, we propose a global model of integration for acquisitions that considers on one side of integration the central mechanisms for coordination that appear in the literature on organizational design: centralization, formalization and socialization. The results obtained confirm our idea that knowledge exploitation requires the boundaries between the acquired firm and the acquiring firm to become diluted and for members of both organizations to interact and relate to one another, which requires a high level of integration in acquisitions. It implies a great level of centralization, in other words, that acquiring firms integrate the policies and systems of acquired firms with a view to enabling the coordination and exploitation of knowledge in line with the ideas proposed by Birkinshaw *et al.* (2002) or Puranam *et al.*, (2006). A high degree of formalization is also needed as it contributes to making both procedures and regulations of the firms involved more homogenous, thereby reducing the uncertainty that typifies acquisitions and encourages stability; a fundamental factor in enabling knowledge exploitation in acquisitions (Shrivastava, 1986; Ranft and Lord, 2002). At the same time, knowledge exploitation in acquisitions requires high levels of socialization during the integration process, as the evidence clearly shows. This means that members of the acquired and acquiring firms relate to one another, interact and communicate. Communication becomes a cornerstone of the process by encouraging trust and generating an atmosphere of understanding that enables knowledge exploitation (Håkanson, 1995; Bresman *et al.*, 1999; Birkinshaw *et al.*, 2000; Ranft and Lord, 2002; Miller *et al.*, 2006). Thus, managers need to look at the design of the integration, to the architectural side of integration, and to use high levels of all coordination mechanisms if they want to reinforce the transfer of knowledge between the acquirer and acquired firm.

However, the results confirm our idea that creating value in acquisitions needs to take into account another less analyzed side. In this study we have highlight the importance of the psychological side of integration. To transfer knowledge between the acquirer and acquired firm demands to look at the motivational side of integration. In this sense, we demonstrate the negative role of a dominant style on the value creation in mergers and acquisitions. Moreover, when integration is characterized by an open style in which the acquirer firm does not lead the change in all areas, the creation of value is greater than when the acquirer firm imposes their own functioning in all functional policies and systems. However, as relative standing theory proposes the removal of autonomy,

increasing the degree of centralization, imply a tendency toward increasing the dominance in the integration style.

For years, managers that have participated in merger and acquisition processes have focused their efforts on the stage of choosing the best partner possible and paid scarce attention to the integration process, a fundamental aspect for ensuring that objectives are reached and for enabling value creation. Despite now overtly recognizing the importance of integration, managers have few tools at their disposal that allow them to face up to the rigours of implementation in acquisitions. This research contributes to guide managers when it comes to taking decisions related to integration in mergers and acquisitions. The most important implication of this study for managers is the relevance of managerial decisions on the process of integration when attempting to exploit knowledge. One wrong decision may generate an inadequate level or style of integration and become an obstacle to exploiting knowledge.

This study has some limitations. Firstly, we are aware of the restrictions that the size of the sample represents for making generalizations about the results of the study. Second, this study allows us obtaining a wide vision of the integration process in acquisitions through the analysis of three coordination mechanisms and the integration style. However, we consider it necessary in the future to develop more complete models that include other factors that may affect the outcome of the integration process for exploiting knowledge and may help to shed light on some of the darker aspects of acquisition management. We believe that the climate prior to an acquisition may be a vital factor when deciding on the integration process for exploitation. The extent to which negotiations have developed and firm employees have been made aware of the process may determine the existence of a hostile atmosphere for transferring knowledge, which would make the process of the integration even more difficult or, conversely, may generate a context that is conducive to encouraging this process.

Lastly, we believe that it would be interesting to analyze the integration process in acquisitions for exploration so that direct relations can be established for these two constructs, in order for them to be approached from an ambidextrous perspective. Thus, answers could be provided to one of the burning questions in the current literature on firm management: the balance between exploration and knowledge exploitation.

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