

# Supply Management: A Capability-Based Approach

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### **Abstract**

In a conceptual model presented at the 19<sup>th</sup> IMP Conference, Brito and Roseira (2003) suggested that supplier management should be analysed at three levels: dyadic relationships, supplier portfolios and networks. This model was later used to study two industrial firms' supplier networks, whose preliminary results revealed consistent differences at each of the three levels (Brito and Roseira 2004). The main purpose of this paper is to present the final conclusions of this comparative study regarding the supplier dyads level and to offer new insights on the links between the goals that industrial firms try to achieve through their supplier relationships and the configurations that those relationships assume. The paper also aims to further the understanding of buyer-supplier relationships as mechanisms of capabilities coordination and development. The research project is mainly grounded on the IMP industrial network approach complemented with insights from the Capabilities Approach. The investigation project revealed that relationships are essential not only as a mean to access and influence suppliers' resources and competences, but also to perceive their existence and signal their value to the client firm, thus conditioning their subsequent use.

Keywords: Supplier management, capabilities, supplier functions, relationship configuration

## Introduction

In the last years, liberalization and globalization of production and trade intensified competition in many industries forcing firms to reformulate their organization and competitiveness bases (Harland, Lamming and Cousins 1999). These trends resulted in the deepening of specialization processes of firms (Cousins and Spekman 2000) and the reinforcement of the interdependencies between buyer and supplier that are characteristic of industrial settings (Mattson 1997). Suppliers' importance is amplified, not only in terms of the financial impact but also, and probably more importantly, in terms of the content of industrial purchases. As Gadde and Håkansson (2001) argue, outsourcing is being extended from production activities to product design and development. In this context, supplier management has to deal with a substantial complexity and diversity. On one hand, specialization processes tend to multiply the suppliers that firms have to manage to obtain the resources they need to produce a given product and this necessarily increases the complexity of managing supplier relationships. On the other hand, firms buy very different things from their suppliers (e.g., standardized products, development activities, information, brands and reputation) and this may require different capabilities from the client and the suppliers' side. As referred by Araújo, Dubois and Gadde (1999), the type of suppliers' resources being explored by a client (and the degree of exploration) is diverse and the interfaces that are established in each case must also be diverse in order to be effective. In other words, the access to suppliers' capabilities and resources can not be separated from the organization of that access.

All these issues seem to justify the strategic character of supply management (Gattorna and Walters, 1996) and the growing interest that buyer-supplier relationships awakens on the academic and business arenas. Despite that interest and the work produced in this area, there seems to be substantial gaps on how firms actually manage their buyer relationships. Specifically, little is known about the type of goals or benefits industrial firms look for in their suppliers and how these goals condition the way they relate to each other. If firms apparently depend more and more on suppliers, as proprietary control is being (at least, partially) replaced by indirect control of resources and capabilities, a better understanding of how suppliers resources and capabilities are perceived and managed will hopefully help managers to develop their supplier strategies and actions in a more effective way.

This paper is divided into seven sections. In the first one, some central concepts of the IMP industrial networks and the Capabilities Approaches are discussed and combined to produce an analysis framework that will guide the subsequent empirical research. The second section presents the framework for analysis built on the basis of the two streams of research discussed in the previous section. The section which follows reviews in a very brief way the methodology used in the research process. The fourth section describes the empirical cases, followed by the fifth section, where the research findings are presented and discussed. The sixth section reviews the research's main conclusions, and the paper closes with the main theoretical and management contributions.

## Theoretical Background

As referred previously, this section focuses on the presentation of basic concepts from the IMP and Capabilities Approach which seem especially relevant in the context of supply management. The discussion of the complementarities between these approaches will hopefully lead to the identification of some issues that, despite their relevance, are still not fully explored. The different concepts are then linked in order to produce a framework that will guide the empirical investigation of this project.

### ***Supplier management in industrial networks – the IMP approach***

The IMP (Industrial Marketing and Purchasing Group) goes back to the 80's, when a group of international researchers started to focus their studies on buying and marketing phenomena in industrial settings. Initially centred on buyer-supplier relationships, the scope of investigation was, later on, expanded to industrial networks. One of the central concepts of the IMP Approach – the notion of interaction – emerged from this investigation projects, revealing buyers and suppliers that are active and interactive parts in their relationships, trying to mutually influence each other, according to their own agenda of interests and goals.

In the IMP Approach, buyer-supplier relationships are processes that evolve while firms participate in complex dealings of actions and reactions (Ford et al. 1998). Industrial relationships have been extensively studied and dimensions like complexity, intensity, continuity (Håkansson and Snehota 1995), dependency, mutual investments (Easton 1992) and particularity (Johnsen and Ford 2001) are some of the characteristics normally identified in this context. However, relationships may exhibit different configurations and, in fact, several authors (Blois 1998; Gadde and Snehota 2000; Ford et al. 2003) contend that relationships must be managed according to the costs and benefits accruing to firms from those relationships. A possible way to analyze this issue is to consider the functions or effects that firms are trying to fulfil in their supplier connections.

In the last decade, several authors (cf. Håkansson and Johanson 1993; Anderson, Håkansson and Johanson 1994; Ford and McDowell 1999) contended that relationships in industrial settings have both direct and indirect functions. Direct functions are those whose effects emerge from, or are reflected upon, the dyadic relationship of direct counterparts. Indirect functions are those whose effects emerge from, or are reflected upon, relationships between dyadic counterparts and other actors. According to Anderson, Håkansson and Johanson (1994), indirect or secondary functions can be more important than direct or primary functions. Although these authors do not provide a common and detailed definition of direct and indirect functions and effects, there seems to be a consensus that the former are, as a tendency, more associated with the efficient use and connections of actors' resources and activities, and that the latter are related to more complex issues like the development of shared network visions, activity chains or the diffusion of new technologies. In the specific context of buyer-supplier relationships, Walter et al. (2003) and Möller and Törrönen (2003) propose a more concrete view of direct and indirect functions. Direct functions are translated in benefits like cost reduction, product quality, volume and sourcing safeguard. Indirect functions can consist in network developing (suppliers work as bridges between the client and other actors), information scouting (clients obtain market or technical information through suppliers) and innovation development. In short, direct functions are associated with efficiency/rationalization goals and indirect functions with innovation/development (products, processes, markets) goals.

Goal setting and relationship configuration are considered essential elements in the field of supply management. Regarding goals, Ford et al. (2003) state that the value of suppliers and their resources depends on the client's goals and context. In the same sense, Gadde and Snehota (2000) claim that relationship value is influenced by multiple contingencies (e.g., firm's operations and strategy, other relationships) and, consequently, it cannot be deducted directly from its content in terms of product and services. In general terms, supplier goals can be defined in terms of the direct or indirect functions and corresponding benefits that clients want to achieve in each supplier relationship. In fact, Möller and Törrönen (2003) contend that the evaluation of supply strategies is rather complex and requires a clear cut definition of the type of functions and effects sought in suppliers. These authors then suggest that the analysis of suppliers' capabilities profile may help to evaluate their potential to produce the desired effects. In this sense, the value of a supplier depends on its ability to perform the functions sought by the client and this ability depends on his endowment of capabilities. As argued by several authors (Ford et al. 1998; Araújo, Dubois and Gadde 1999; Ford et al. 2003; Gadde and Persson 2004), the achievement of efficiency or development goals requires different combinations of direct and indirect capabilities on the supplier side and also on the buyer's side.

Regarding relationships, Araújo, Dubois and Gadde (1999) and Gadde and Persson (2004) stress that relationships and the roles played by the different actors in those relationships condition the type of suppliers' capabilities and resources being explored and how they are being explored. The 'how' is defined by the type of relationship connecting clients and suppliers and their posture within the relationship. Araújo, Dubois and Gadde (1999) contend that the quality of a relationship is heavily influenced by the structure of interfaces (technical interdependencies) that connect clients and suppliers. These authors identify four types of interfaces – standardized, specified, translated and interactive – that have different consequences on costs, productivity, learning and innovation potential. In standardized interfaces, the client buys a standard product benefiting from the suppliers economies of scale and scope. In specified interfaces, products are manufactured according to the client's specifications and suppliers are mainly used as production capacity buffer. In translated interfaces, the supplier translates into a specific product the functionalities and utilization context defined by the client. Finally, in interactive interfaces, products are co-produced by both parties fostering the combination of their knowledge. These different interfaces impact on the utilization of both client's and

supplier's resources, capabilities and activities and the possibility of exploring the rationalization or development functions that they support. Araújo, Dubois and Gadde (1999) stress that different interfaces require different levels of investments and that the possibility of obtaining the expected results depends on the client's and supplier's ability and willingness to make those investments.

In addition, supplier management also has a subjective component that reflects the perceptions about the counterparts and the relationships. On one hand, clients' network theories may condition the evaluation of suppliers' resources and capabilities. Johnsen and Ford (2002) contend that suppliers' resources and capabilities are considered valuable only if they are seen as important contributions to the relationships. The perception and evaluation of resources influence the expectations about the benefits that can be extracted from relationships and, consequently, the interest in investing in those relationships. On the other hand, this subjective evaluation also includes the adequacy of relationships types to the goals defined for each supplier. For instance, cost reduction can be achieved by establishing distant relationships with several suppliers and by fostering competition among them. Conversely, Cannon (2001) refers that, often, suppliers reward their clients' loyalty with lower prices and Avery (1999) and Birch (2001) describe cases of companies that achieved substantial cost reductions by concentrating their purchases in a small number of suppliers. Thus, similar supply goals can be achieved by different relationship types, according to the subjective perception of the association between goals and relational configurations.

In sum, buyer-supplier relationships have been an important focus of interest in the IMP approach. The notion of direct and indirect functions and the suggestion that suppliers' capabilities can be seen as a precondition to suppliers' ability to perform specific functions constitute important elements for a better understanding of supplier strategies in industrial networks. However, the issue of capabilities that has recently gained a higher prominence in the IMP approach is still insufficiently explored. In this context, the Capabilities Approach can be a valuable contribution to a better understanding of relationships as a form to organize the access to suppliers' capabilities.

### ***A multiple view of capabilities – the Capabilities Approach***

Richardson (1972, 1998) states that the basic purpose of firms is to plan and execute the processes required to produce and sell a good or service. Firms are centres of coordination and execution of different activities, whose nature and diversity depend on firms' organization and capabilities. As Penrose (1959) had already suggested, firms tend to perform activities that are related to their specialization in specific capabilities (resources in Penrose's terms). The production of a product and/or the provision of a service is a process where distinct but complementary activities must be coordinated. Activities may exhibit different degrees of complementarity (according to their interdependency and sequence) and similarity (according to the similarity or dissimilarity of their supporting abilities). The combination of these two activity dimensions (complementarity and similarity) calls for different coordination mechanisms. Market transactions are normally used to coordinate complementary and dissimilar activities, direction (firm) to coordinate closely complementary and similar activities and inter-firm cooperation to coordinate complementary but dissimilar activities. Richardson (1972) then argues that coordination mechanisms require the development of an external organization supported by different capabilities to access the internal and external activities of firms. Despite of the importance of his work, Richardson (1972) does not fully explore the notion of capabilities that is extended by other authors.

Loasby (1996, 1998a) argues that, as most part of the knowledge a firm needs to be successful resides outside of it, it needs to build an external organization (its specific set of relationships) in order to access that knowledge. The possibilities of acquiring knowledge from other firms are limited by its endowment in direct and indirect capabilities. Direct capabilities consist of knowing how to "make things" and indirect capabilities of knowing how to "get things done by others" (Loasby 1998a). Indirect capabilities allow firms to specialize and develop direct capabilities while accessing complementary and dissimilar capabilities (Araújo, Dubois and Gadde 1999). In this context, inter-firm relations embody structures of complementary knowledge that may result in competitive advantages for the companies that are able to develop effective combinations of direct and indirect capabilities (Foss and Lusby 1998). Making and selling products require knowledge residing in the structure of direct and indirect capabilities within each firm, supplemented by the structure of indirect capabilities that connects it with other firms (Loasby 1998b). Araújo, Dubois and Gadde (2003) contend that indirect capabilities are always present in inter-firm relations, even if these assume different natures and

complexity levels – e.g., specifying and buying inputs, or coordinating and integrating internal and external inputs. The type and complexity of indirect capabilities may vary according to the type of resources of activities that are explored through the firms' external organization. Furthermore, suppliers' capabilities can be accessed, explored or even developed in combination with the clients' capabilities calling for increasingly indirect, complex and dynamic capabilities. Besides accessing capabilities that firms do not control, inter-firm relations may also be used to influence them (Mota and de Castro, 2005). Accessing or influencing external capabilities probably requires different relational capabilities and relational formats.

In addition, Takeishi (2002) suggests that a distinction must be made between activity division – who is responsible for the task of designing and manufacturing – and knowledge division – who holds the knowledge supporting those tasks. The distinction between activity outsourcing and knowledge outsourcing proposed by Fine and Whitney (1996) also adds to the complexity and diversity of goals that firms may pursue in their supplier relationships. Fine and Whitney (1996) distinguish activity dependence from knowledge dependence. In the former case, suppliers work as an extension of the client's productive capacity. Although the client is able to produce the input, he chooses to buy it, but retains the knowledge required for its development and production. In the latter case, the client is not able to produce the input and when buying from a supplier, the client is buying the input and the knowledge embedded in it. Thus, as suggested by Brusoni and Prencipe (2001) what the firms makes does not always match what the firms knows. Activity boundaries tend to be narrower than knowledge boundaries as inter-firm coordination of activities normally requires some degree of overlapping knowledge (Richardson 1972; Takeishi 2001, 2002)

The choices about activities and knowledge sharing, i.e., their boundaries, are more decisive than the apparently simple decision about make-or-buy. These choices are influenced by the structure of firms' direct and indirect capabilities and by the conjectures that frame them (Loasby 1996, 1998b), namely about the capabilities specificity' (the range of future activities they support) and the adequate level of control (proprietary or indirect). Direct control of capabilities is unnecessary if a firm is able to access them through its counterparts and to organize that access (Araújo, Dubois and Gadde 2003). Furthermore, the preference for control reduces the firm's dependency in knowledge and capacity, but also reduces the possibility of creating new knowledge, as this arises from the diversity of conjectures hold by different firms (Foss and Loasby 1998). Thus, if a firm is looking for innovation or development benefits, inter-firm relationships are, from this point of view, a more effective way to do it than the development of internal activities and capabilities that are framed by a firms' single and idiosyncratic conjecture.

However, it seems unrealistic to expect that firms are looking for development capabilities in all of their suppliers' relationships. Rather, it seems more reasonable to consider that firms try to access simultaneously different types of capabilities according to their needs and goals. At this point, it might be useful to refer the distinction between static and dynamic capabilities. Loasby (1998b), Araújo, Dubois and Gadde (1999) and Foss (1999) explain how static capabilities are used to optimize the existent (e.g. scope and scale economies) and dynamic capabilities are used to integrate, develop and re-configure internal and external capabilities and resources. Loasby (1998b, p. 144) states that "capabilities are in large measure a by-product of past activities, but what matters at any point of time is the range of future activities which they make possible" and "the possibility of shaping capabilities". In a similar view, Araújo, Dubois and Gadde (1999) argue that rather than evaluating suppliers' current offers that express their static efficiency, buyers should evaluate supplier's capabilities that shape their dynamic efficiency and condition their potential to add value to the client's business.

In short, the Capabilities Approach offers a rich view on the type of capabilities that firms can develop internally or access through their suppliers. In this perspective, the access of suppliers' capabilities can not be separated from the organization of this access, namely through adequate investment in inter-firm relationships and capabilities' structures and the definition of adequate counterpart boundaries. The organization of capabilities access is also fundamental to understand how firms can explore in a more or less effective way their supplier relationships network and the benefits they can achieve in this way. However, it still seems insufficient to understand buyer-supplier relationships, the type of goals or benefits that industrial clients try to obtain through these relationships and how these goals are related to the relationships organization, namely how activities and capabilities are shared, contracted or expanded in interaction processes. In the next section, the IMP and Capabilities Approach are combined in order to produce an integrated framework to analyse the links between the

type of goals (translated in functions and capabilities) to be explored in each suppliers and the configuration of relationships set to do it.

### The Framework for Analysis

The notion of interaction, central to the IMP Approach, complements and furthers Richardson’s (1972) views on the external organization and inter-firm relations as coordination mechanisms. While the Capabilities Approach seems to regard the access of external resources, activities and capabilities as the result of firms’ ability to make the adequate investments (namely in their structure of direct and indirect capabilities), the IMP Approach has a more complex and complete view on this issue, by stating that buyer and supplier interact according to their goals, visions and strategies and providing actors with the intentionality that seems to lack in the Capabilities Approach.

The role of suppliers, insufficiently addressed by the Capabilities Approach, is more central in the IMP Approach. Supplier management goals can be expressed in terms of the direct and indirect functions that are set in supplier relationships. If capabilities are seen as pre-conditions to perform specific functions, then the multiple definitions offered by the Capabilities Approach are an important element to consider in this context. It seems reasonable to expect that direct or efficiency functions (as defined in the IMP Approach) are supported by capabilities closer to the notion static capabilities and that indirect or innovation/development functions are supported by capabilities closer to dynamic capabilities. Furthermore, as firm moves from the exploration of direct functions to indirect functions its mix of capabilities may need to exhibit a growing proportion of indirect capabilities as compared to direct capabilities. Both approaches seem to share the idea that the exploration of supplier functions (in the case of IMP Approach) or capabilities (in the case of Capabilities) is conditioned by firms’ ability to make adequate investments in their own technical and relational capabilities.

However, these issues that are well developed at a theoretical level seem poorly supported by empirical evidence, leaving room for further research. Figure 1 presents a tentative linking of these issues in an integrated framework that will hopefully help to expand knowledge in this area.

Figure 1 – A framework for the analysis of buyer-supplier relationship management

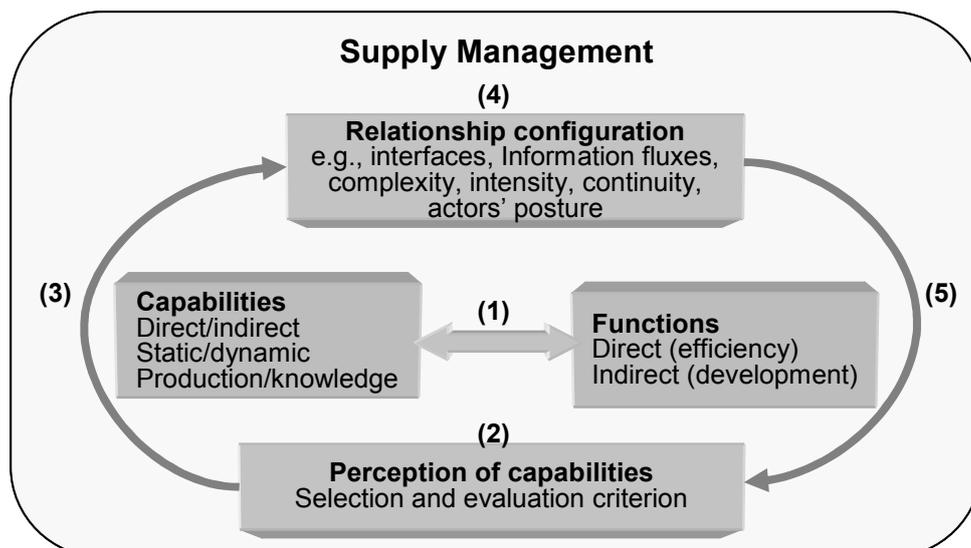


Figure 1 portrays the link between capabilities and functions (1). Existing literature stresses the omnipresent role of capabilities as factors that constrain firms’ ability to perform specific relationship functions. But, this connection can assume the opposite direction as relationship functions may also impact suppliers’ capabilities. This impact may be translated in several ways – optimization, reconfiguration, development of capabilities - according to type of functions being explored in

suppliers' relationships and to the way those functions evolve. While exploring the same type of functions may lead to the optimization or supporting capabilities, the exploration of new functions (e.g., moving from direct to indirect functions) probably requires some type of reconfiguration of supporting capabilities or even the development of new ones.

However, the exploration of functions and their supporting capabilities is framed by the perception that firms have of their counterparts' capabilities (2) and also the type of relationships they are able and willing to mutually develop (4). In order for supplier capabilities to be fully explored they must be recognized by the clients and considered a valuable contribution. This framework suggests that selection and evaluation criteria are important factors in the way capabilities are perceived. In a simplified way, selection criteria may be considered as a proxy to the type of functions that clients are looking for in their suppliers and actual selection may be seen as the recognition that suppliers have the adequate capabilities to perform those functions. The evaluation criteria and process may also be indicators of which suppliers' dimensions are considered vital by the clients and of their perception on how effectively suppliers' capabilities are actually being used to perform the required functions.

The perception of suppliers' capabilities and potential is probably an important factor in relationship configuration (3). The type of relationship to be established with suppliers is, among other factors, driven by clients' goals for each of them and by the evaluation of suppliers' capabilities. If suppliers' capabilities are considered valuable, the client still has to be able to develop a relationship that enhances their effective utilization (4). Furthermore, relationship configuration (expressed in how relationship characteristics are combined in each case) may probably affect the perception of capabilities (5), leading to an eventual revision of selection and evaluation criteria, and thus having an additional effect on how and what type of supplier capabilities are explored by the clients.

## **Research Method**

To investigate the issues organized in the framework, the research adopted a case study approach. In this context, the literature suggests that the cases' relevance to the investigation goals (George and Benett, 2005) and their learning potential (Dubois and Gadde, 2002) are essential factors in case selection. The selection process was driven by these ideas and the cases included in this investigation were chosen according to these principles of relevance and learning potential. In this context, two industrial firms – (1) Adira, a family-owned manufacturer of machinery to cut steel, and (2) Vulcano, a manufacturer of gas-fired hot water systems fully owned by the international group Robert Bosch – were selected based on the pre-understanding that they explore different suppliers' functions. The main guiding line to select the cases was to have a case where the client would be mainly seeking to explore direct functions in their supplier relationships and another case where the supplier functions would be mainly of an indirect nature. This differentiation enabled the research of the links between functions and capabilities and also of how these links are reflected upon and framed by the process of developing and managing supplier relationships. Exploratory interviews were conducted in both firms to verify their adequacy in this context and confirmed their differentiation in terms of supplier functions – Adira is mainly looking for direct functions in its supplier relationships and Vulcano is mainly focused in indirect functions.

The selection of the cases and the analysis of the collected data followed a process close to the configuration analysis proposed by Ragin (2000). Each case was analysed individually in order to understand how the several dimensions combine in an integrated and coherent way to form different configurations of the same phenomenon, followed by a comparative analysis between the two cases in order to identify and explain their (dis)similarities. The research was based on semi-structured interviews conducted in the two focal firms and some of their suppliers. All interviews were taped, transcribed and their analysis was mainly supported by the use of Nud\*ist 6 software. Internal documents, Internet sites and press articles were also used as sources of information about the focal companies and their suppliers.

## **Case Studies**

As mentioned before, this paper is supported by the empirical investigation of two industrial firms' supplier networks – Adira and Vulcano - that are briefly presented in the next paragraphs. The cases

presentation and analysis is restricted to the issues in debate here, although the investigation covered a much wider set of problems and areas.

### **Case 1 – Adira**

Adira is considered the largest Portuguese machinery manufacturer. Purchase goods account for 40-50% of production costs. A manager says Adira is a “highly vertically integrated company”. The company has two main types of suppliers: *catalogue suppliers* and *subcontracted suppliers*. The client holds 2-3 alternative suppliers (catalogue or subcontracted) for each type of part or material, as this “enables [it] to have continuous choice and assure continuous delivery in case of failures of one of the suppliers”.

Catalogue suppliers range from multi-brand representatives to national agents or international firms like Bosch or Siemens, selling standardized materials and components. Product standardization enables the focal company to buy the same component from different suppliers “keeping its independence”. Relationships with catalogue suppliers are normally long with low intensity (less than one contact per month) and complexity (one or few people from Adira are involved). Subcontracted suppliers range from micro to medium-size firms that manufacture parts according to Adira’s specifications. Adira performs the activities of all but one of his subcontracted suppliers, ensuring a strong control over their processes, costs and prices. Subcontracted suppliers are highly (sometimes totally) dependent on the purchases of Adira and, in several cases, they also buy raw-materials and production tools from the focal company. Relationships with subcontracted suppliers are long, intense (sometimes several contacts per day) and complex (involving several people from Adira).

The division of activities between Adira and its suppliers has remained the same throughout the years and the same happened to interfaces as machines have always been developed internally with little contribution from the suppliers. Subcontracted suppliers have always been managed through specified interfaces: Adira sets materials/parts and, sometimes, production processes’ specifications and suppliers execute the productive activities. Expressively, Adira’s CEO defines subcontracted suppliers as “external workstations”, utilized as production buffers. Adira uses them to pursue direct/efficiency functions: lower costs, higher flexibility and sourcing safeguarding. Catalogue suppliers are managed through standardized interfaces – standardized products are developed internally and without interference from the client and sold to a variety of clients from different industries. Adira may ask them for some advice for the best options available in their catalogues but the integration of components in Adira’s machines is done exclusively by the client.

Adira managers’ view is that apart from the international manufacturers, suppliers have very limited capabilities, restraining the possibility of involving them in more complex tasks. This idea is supported by past experiences to change technical interfaces, namely “asking selected suppliers to present a solution according to specified functions” that have proven to be more expensive than to do it internally. The smallest suppliers acknowledge their limited capabilities and lack of interest in moving from manufacturing tasks to more complex ones. The case is quite different with the larger suppliers (subcontracted or catalogue) that hardly recognize themselves in the picture drawn by the focal company. Some of them say that they would be able and willing to be more active in some areas like product development, as they do with other clients, but they don’t foresee this evolution, which would “go against Adira’s philosophy” that is “strongly internally oriented” and anchored in a “highly competent team”. Similarly, Adira recognizes that involving a few specific suppliers in the development phase could be potentially positive, but this is not done because “it is not in the company tradition”.

The major benefits the focal company looks for when selecting suppliers are low prices, product quality/reliability, flexibility and availability (worldwide, in the case of the catalogue suppliers). Evaluation process is centred on three main aspects – quality/reliability, prices and speed of delivery. Quality is the clearly dominant factor - from the 84 maximum points that suppliers can achieve, 64 focus on organizational or product aspects related to quality, 10 focus on prices and financial terms, 7 on logistic issues and 3 on relational dimensions. The data that underlies the classification of suppliers is retrieved from the client’s information system. Selection and evaluation processes are consistent with each other and also with the goals of efficiency/rationalization that Adira seeks to achieve through its suppliers.

## **Case 2 – Vulcano**

Vulcano was founded in 1977 to produce gas-fired hot water systems under a Bosch technological license. Vulcano was designated Bosch's competence centre for gas-fired hot water systems in 1993 and is presently fully owned by this international firm. Although the company has been outsourcing some productive activities in the last years, managers think that it is still too vertically integrated and are willing to continue the outsourcing process and concentrate further in their core competences – instant production of hot water. Vulcano supplier base is constituted by medium to large-size, local or foreign companies that have or must develop “a minimal structure of resources in quality, logistics, manufacturing, development and management”. Supplier base was substantially reduced in the last years and there now are 2-3 suppliers per supply area.

Vulcano's relationships with its suppliers are generally long lasting and perceived as positive by both sides. Throughout the years, activities, resources and interfaces have been changing due to the evolution of Vulcano and its supplier strategy and the evolution of suppliers' resources and capabilities. Almost all bought parts are customized to the focal company's needs. Traditionally, Vulcano specified all parts' details (functions, materials, dimensions) and suppliers manufactured them. In the last 5-6 years, Vulcano's development team has been actively seeking suppliers' assistance to develop the parts. Interfaces are specified or interactive. Interactive interfaces are especially common in areas where Vulcano doesn't hold sufficient productive or knowledge capabilities and doesn't want to develop them (like electronics). However, even when specified interfaces are used (e.g. suppliers of outsourced activities), they normally assume an interactive nature as the focal company expects all suppliers to “proactively produce and suggest new solutions in terms of product specifications, materials or processes”. Relationships' complexity and intensity vary according to the buying process phase – they are high during the part's development or modification phases and lower after the parts enter the regular production phase, when contacts become less frequent and concentrated in the logistic area.

The processes of selecting and evaluating suppliers are based on several criteria. Aspects like quality, price, flexibility and continuous sourcing are relevant, but considered as mere qualifying factors. Dynamic and indirect capabilities are what really differentiates suppliers, e.g., “their ability to assist in parts development” or to be able to “develop a vision of the business, of the complementarities rather than just of the product or the manufacturing”. In this context, suppliers' networks of clients are an important selection criterion, as they help to evaluate if suppliers have enough *critical mass* to undertake the investments needed to support the focal firm's goals. Additionally, suppliers' relationships with other clients are seen as a source of diversity and as learning opportunities that may reflect positively on Vulcano. The evaluation process calls for the equal participation of three areas – purchasing, quality and logistics. It is a mix of quantitative and qualitative components that constitutes an important basis to decide upon how to manage each relationship (maintain, develop, invest, withdraw, etc.). As suppliers' current offers are less prized than their potential to add value to Vulcano's own business and this is hardly evaluated through “formal metrics”, subjective evaluation is of outmost importance. As the Quality Manager explains “The question ‘what is your opinion about this supplier?’, even if we have a formal evaluation of that supplier, is an information so, or even more, important than all the accounting of deliveries, complaints...”. In fact, technical excellence is only valued if, at the same time, suppliers understand the focal firm's business and how their activities and capabilities can be proactively used to enhance the client's products or to reduce its costs.

## **Research Findings**

Having presented the cases' individual descriptions it is now time to make their comparative analysis that will be used as a basis to present and discuss the findings that emerge from the empirical research. The links between relationship configurations and supplier functions and capabilities perception will be the main focus of attention in this context.

### ***Suppliers' functions and capabilities and relationships' configurations***

The individual and comparative analysis of the cases exposed some expected and some unexpected aspects of the impact of supplier management on the supplier's contribution to the clients performance. Table 1 illustrates the different functions and capabilities that both firms seek in their

suppliers and the diversity of interfaces used to access them. It highlights Adira’s preference for the exploration of efficiency goals (direct functions) through specified or standardized interfaces and Vulcano’s willingness to pursue development goals (indirect functions) though interfaces that are increasingly interactive.

Table 1- Comparison of dyads’ characteristics

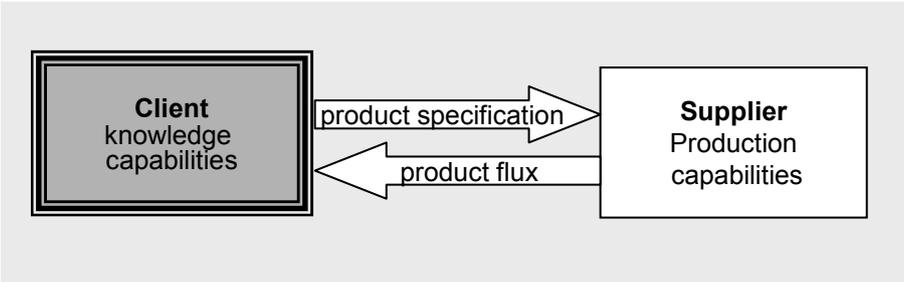
| Relationships’ characteristics             | Adira   | Vulcano   |
|--|---|---|
| Suppliers’ functions                       | direct functions                                    | indirect functions                                |
| Suppliers’ capabilities being explored     | productive (subcontracted) knowledge (components)   | productive and knowledge                          |
| Technical interfaces                       | specified (subcontracted) standardized (components) | interactive and specified                         |
| Complexity and intensity                   | high (subcontracted) low (components)               | variable (according to the buying process phases) |
| Atmosphere                                 | satisfactory  | satisfactory                                      |
| Continuity                                 | normally long                                       | normally long                                     |
| Mutual knowledge                           | asymmetric (subcontracted) and poor (components)    | symmetric   |
| Symmetry and density of information fluxes | low density, asymmetric                             | variable (according to the buying process phases) |

The data presented in this table does not sustain the existence of a clear link between the nature of suppliers’ capabilities (productive or knowledge) being explored by the client and the type of relationships used to explore them. For instance, relationship atmosphere and continuity are similar in all cases; productive capabilities may be supported by highly complex and intense relationships (Adira – subcontracted suppliers) or by low complex and intense relationships (Vulcano’s components production phase); knowledge capabilities may be supported by distant relationships (Adira - component suppliers) or close relationships (Vulcano’s component development phase).

In this context, the typology of technical interfaces proposed by Araújo, Dubois and Gadde (1999) was a useful tool to analyse client-supplier dyads in both cases. In the next paragraphs, the evidence produced in this area is analysed in more detail.

Adira’s uses specified interfaces with its subcontracted suppliers and has a clear dominant role. Adira’s and its suppliers’ capabilities have a different nature and are used in sequence (cf. Figure 2).

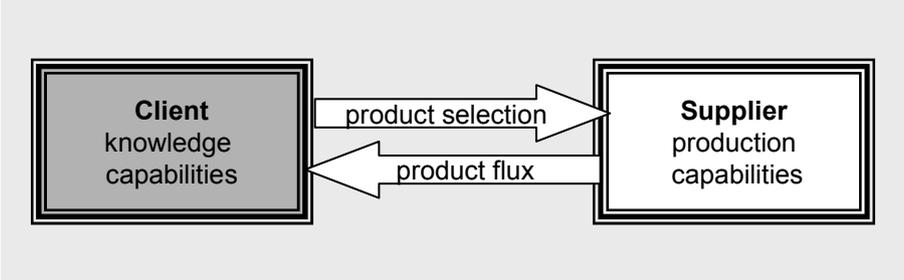
Figure 2 – Capabilities and firms’ boundaries in specified interfaces



Firstly, Adira uses its knowledge capabilities to specify the parts and the productive processes and then the suppliers use their productive capabilities to manufacture the parts. In this case, client-supplier interaction may be low and information fluxes are normally unidirectional (client to supplier). As Figure 2 shows, firm boundaries are quite clear: the client works as a kind of black box – suppliers have very limited knowledge about the client, namely the context of utilization of the parts they produced. Adira’s subcontracted suppliers do not know how and where the parts they manufacture are integrated in the client’s machines and, in fact, they regard that information as useless for the type of tasks they perform. However, as the specification process requires the client firm to be knowledgeable on various aspects of manufacturing activities (equipments, productive processes, materials and so on) in order to set the guidelines for the suppliers to execute these activities, suppliers’ boundaries may be less opaque than those of the clients

In the standardized interfaces that characterize the relationships between Adira and its component suppliers, both parts use their knowledge capabilities in a sequential process (cf. Figure 3).

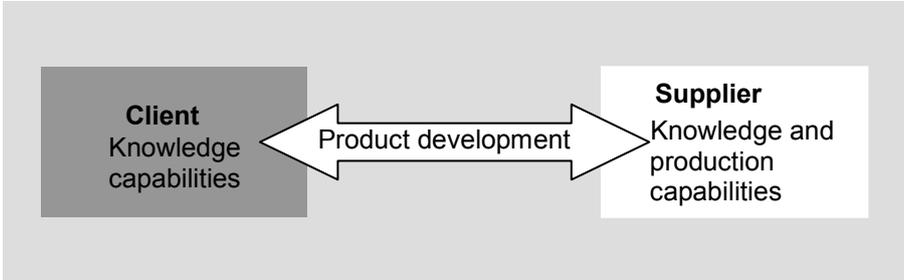
Figure 3 – Capabilities and firms’ boundaries in standardized interfaces



Suppliers use their capabilities to design the parts and afterwards, the client uses its knowledge capabilities to select the right part and to integrate in its machines. In this case, suppliers’ products are not influenced by the specific context of the client, which does not interfere in their definition. Mutual knowledge and information fluxes may be minimal and both firms work as black boxes. The access of knowledge capabilities is thus compatible with relationships with low interaction, complexity and intensity, close to transactional models.

When suppliers are involved in product development processes, the scenery is quite different – relationships are more interactive and firms’ boundaries less clear, as illustrated in Figure 4.

Figure 4 - Capabilities and firms’ boundaries in interactive interfaces



In these cases, as shown by the dyads between Vulcano and various suppliers, knowledge and innovation cannot be attributed exclusively to one of the actors. Rather, they are largely co-produced within interactive relationships characterized by dense and bi-directional information fluxes. Furthermore, productive knowledge goes beyond actors’ productive activities in order to create a common base of language and technical contexts that seem indispensable to the development,

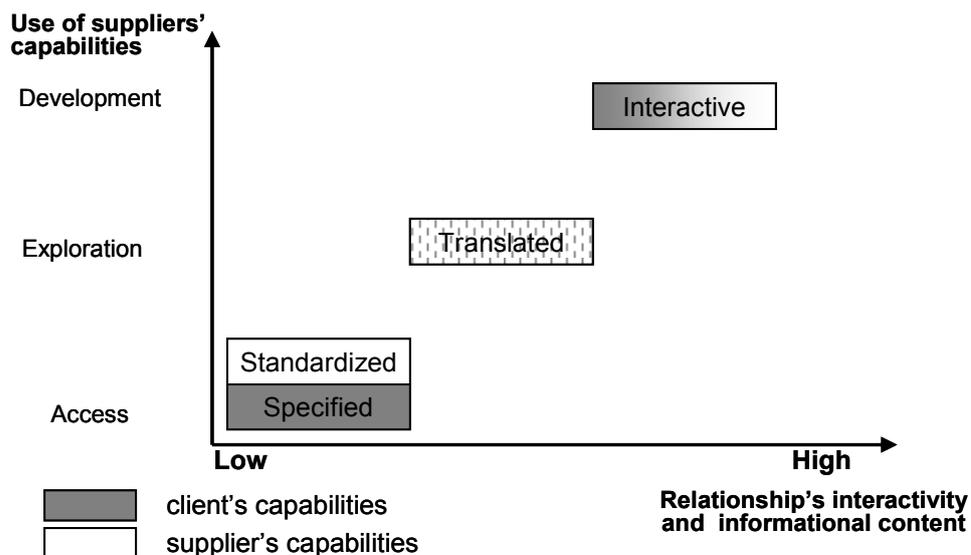
execution and evaluation of the more complex tasks of development. The creation of this common knowledge and the integration of some activities are also reflected and reflect a dimming of firms' boundaries that enhances further integration and provides opportunities for mutual influence and learning.

As Figures 2, 3 and 4 suggest, suppliers' production and knowledge capabilities can be accessed and combined with the client's own capabilities using different relational configurations. As such, it seems not possible to define a fixed relationship profile that can be associated to a specific type of supplier capability being explored by a client.

However, a deeper analysis of this issue revealed that if one considers different ways of using suppliers' capabilities, some relational features seem to emerge in a more consistent way. These dissimilar uses are related to Loasby's notions of static and dynamic capabilities. The evidence from the cases suggests that a firm may be interested in a supplier mainly for its manufacturing resources and capabilities and/or for its knowledge resources and capabilities, but this can be done in a more static or dynamic way. In fact, in the first situation, the relationship organization may grant the supplier no space for any kind of initiative to reconfigure the product, the productive process or both, leading to a static deployment of its resources and capabilities, as shown in the case of Adira. Alternatively, the client may be opened to the suppliers' initiatives and suggestions (emerging or not from their set of experiences with other clients) that can result in changes of materials, products, processes, leading to new ways of combining the resources, activities and capabilities of client and supplier, as in the case of Vulcano. In an analogous way, knowledge capabilities may also be used in more static or dynamic ways.

The notions of access, exploration and development as proposed by Araújo, Dubois and Gadde (2003) represent increasingly dynamic ways of using suppliers' capabilities. The joint analysis of these different uses of suppliers' capabilities and the different technical interfaces between client and supplier may lead to a better understanding of the links between capabilities and relationship configuration. The cases of Adira and Vulcano suggest that relationships' informational content and symmetry, interactivity degree and firm boundaries are the features that seem to be more influential (and influenced) on the type of suppliers capabilities that are accessed and the way the access is organized. The actor's leading roles and the way that their capabilities are used are also different in each case, as Figure 5 suggests.

Figure 5 – Capabilities' use and relationship's interactivity and informational content



When the client is 'only' trying to access the current suppliers' capabilities (or what he thinks are the suppliers' capabilities as discussed later on), specified and standardized interfaces seem an adequate and efficient way of organizing that access. In both cases, low levels of interaction, information density

and reciprocity are common traits of relationships. Firm borders may be clearly designed and the client normally assumes a black-box position, controlling the information conveyed to the suppliers. Information fluxes are usually limited and restricted to aspects of product and process specification or selection of components.

By the contrary, on the case of interactive interfaces, when actors are trying to create new solutions in products or processes, there is a higher proportion of shared or co-produced resources, capabilities and activities. As Vulcano's dyads show, there are periods when client and buyer perform their activities in parallel and others when they come together to analyse and test the proposed solutions or find new ones and/or to create common production, quality and logistic tools and procedures. As, in industrial contexts, innovation is not an abstract process, but rather it is directed to concrete processes that are part of specific production and user contexts, client and suppliers must be quite knowledgeable about their counterparts in order to be effective in this area. Thus, as a tendency, firms become more transparent, borders thinner and fuzzier, client-supplier integration higher, and information fluxes more dense and symmetric. In this scenery, counterparts can be rather active to produce suggestions that may help their counterparts solve specific problems or, in a more general way, be more productive or add more value to their businesses. Vulcano and some of its suppliers stress the importance of this mutual collaboration and how benefits for both parties can be created and enhanced in this way.

However, in order for this to happen, knowledge on each other may have to go beyond the technical capabilities, activities or resources. In fact, suppliers' technical dimensions may be led by a strategic view of the client's business, calling for strong relational (indirect) and dynamic capabilities from both parties. As Vulcano purchasing manager states, suppliers' relational and strategic capabilities are the base for their strong technical capabilities. In this sense, this manager stresses that the source of value of some suppliers is "not just their technical capabilities (...). It is much more than that. It is the spirit of the business that precedes the need to create internal technical capabilities". Furthermore, the knowledge required in this type of interactive relationships may, in fact, include aspects that are not of productive nature, namely information about counterpart's networks of relationships and strategies. This requires the willingness to mutually disclose this type of information and solid relational and strategic capabilities to interpret and use it in actions that may benefit both counterparts.

If the static/dynamic use of suppliers' capabilities seems to be closely related to some dimensions of relationships, the link between relationships' configurations and capabilities is not limited to these aspects. In addition, relationships' configurations may influence the perception and evaluation of suppliers' resources and capabilities and, consequently, their utilization by the client. This idea is developed in the next paragraphs.

### ***Relationships' configurations and the perception of capabilities***

The comparative analysis of the cases will now focus on the link between relational configurations and the perception of supplier capabilities' usefulness to the client, as suggested by Mota (2000). Table 2 summarizes the characteristics of client-supplier relationships (both in Adira and Vulcano cases) that seem more relevant in this context.

Table 2 – Comparison of dyads' characteristics and capabilities perception

| <b>Relationships' characteristics</b>   | <b>Adira</b>   | <b>Vulcano</b>   |
|---|--|--|
| Scope of capabilities perceived by the client                                   | restricted to those used within the relationship   | wider than those used within the relationship  |
| Convergence of perceptions about suppliers' capabilities                        | high (subcontracted)<br>low (catalogue)  | high   |
| Functions and capabilities integrated in the selection and evaluation processes | <ul style="list-style-type: none"> <li>• efficiency functions</li> <li>• static and direct capabilities</li> </ul> | <ul style="list-style-type: none"> <li>• efficiency and development functions</li> <li>• direct and indirect, static and dynamic capabilities</li> </ul> |
| Appreciation of suppliers' initiatives  | low  | high   |

The analysis of Tables 1 and 2 suggest that a stronger intensity, complexity and interactivity of relationships contributes to a perception of suppliers capabilities by the client that is more consistent with the picture drawn by the suppliers themselves than relationships that are less intense in these characteristics. Relationships that are more intense and complex (Adira-subcontracted suppliers and Vulcano), more interactive and exhibit a stronger informational density and symmetry (Vulcano) seem to enhance a wider and more rigorous knowledge about the suppliers and their internal and external contexts, allowing client and supplier to develop similar views of the latter's capabilities. For instance, Adira's view about the capabilities of the catalogue suppliers is substantially different from their own view, as they believe that their set of capabilities is wider and more sophisticated than the client thinks. Differently, the dyads between Vulcano and its suppliers are usually more interactive and both parties describe similar pictures of suppliers' capabilities, even when these are only partially used by the client.

Furthermore, selection and evaluation processes seem to play an important role in the development of perception of suppliers' capabilities. On the client's side, actors tend to focus and value in suppliers the dimensions that integrate the selection and evaluation processes and disregard the dimensions that are excluded from those processes. On their side, suppliers tend to focus on the dimensions that are positively valued by the client, regardless of the value that these aspects have to them. Significantly, in both cases, both parties share a common vision about the type of benefits that the focal clients are looking for in their suppliers, suggesting that clients' expectations are effectively communicated to suppliers. This communication can assume explicit and implicit forms. Selection and evaluation processes represent the more explicit tools, as the criterion included in this processes are rather formal and well known by all the actors involved. In the case of Adira, selection and evaluation criterion are restricted to efficiency (direct) functions and the static capabilities that support these functions become the focus of attention. In the case of Vulcano, selection and evaluation factors are related to the exploration and development of suppliers' capabilities and this is reflected in their willingness to exhibit all their capabilities, even those not used by the client in a given moment.

Moreover, interaction processes provide the actors with implicit clues about what is expected from the suppliers. On one hand, the mobilization efforts and investments made by the client are consistently aligned with their supplier management goals. Thus, these actions implicitly reinforce the importance given to the capabilities that are perceived as most valuable to the achievement of the client's goals and guide the actions taken by suppliers in order to respond to those goals. On the other hand, the way actors act and react also influence their perception of suppliers capabilities and the way they are valued. In a somewhat circular way, Adira favours a passive attitude from the suppliers that they assume whether because this suits their interests whether because they fear the client will react negatively to their initiatives. The passivity of suppliers feeds Adira's perception of the limitation of suppliers' capabilities and reinforces its attitudes towards them. In fact, Adira's visions reflect a partial or an historic view of its suppliers' inventory of capabilities that exist or may have changed without the client noticing it. On its turn, Vulcano incentivises and values a proactive attitude from its suppliers and finds echoes on their actions and their supporting capabilities. In the case of Vulcano, this produces a more convergent perception of its suppliers' capabilities that, at the same time, is dynamic evolving with the actors and the relationships' evolution.

## **Conclusions**

The comparative analysis of the cases suggests that the combination of relationship goals that clients want to explore, with the capabilities of each supplier results different relational formats. However, the differentiation of capabilities in terms of productive capabilities and knowledge capabilities, as proposed by Fine and Whitney (1996), seems to bear no consequence in terms of the configuration of the relationships built to access them that can be similar in various dimensions, like continuity or complexity. Actually, more relevant than the nature of the capabilities is the degree of dynamism of their utilization, that has a visible impact on the relationships' interactivity and informational density and symmetry. The cases reveal the existence of a continuum where, as ones moves from the 'mere' access to the exploration and development of suppliers' capabilities, relationships change and some

dimensions like interactivity, information symmetry and density and firm's boundaries dilution become more important in order to support the growing complexity involved.

The higher interactivity, informational density and symmetry of relationships that aim to dynamically explore suppliers' capabilities are accompanied by the dilution of firms' boundaries. This dilution enhances the acquisition of mutual knowledge that sustains the combination and co-development of capabilities, resources and activities of both clients and suppliers. The cases confirm the distinction between activity boundaries and knowledge boundaries as proposed by Takeishi (2001, 2002) and Brusoni and Prencipe (2001), and the larger extension of the latter. Still, when the exploration of suppliers' indirect functions are at stake, this study reveals a gap between the activity and knowledge boundaries that is wider than suggested by these authors. As indirect functions (innovation and network) are fostered by the diversity of supplier's counterparts, clients may feel the need to understand those connections. In this situation, knowledge boundaries tend to expand into the suppliers' network positioning and counterparts, namely other clients and the content of relationships with those clients, including information that is not directly associated with suppliers' technical or productive contexts.

The investigation of the link between relationship types and the perception and evaluation of suppliers' capabilities as proposed by Mota (2000) led to the identification of a group of relational 'signs' that have a significant impact on how suppliers' capabilities are perceived and evaluated. Relationships hold implicit (revealed in relationships configurations) and explicit signs (suppliers' selection and evaluation criterion) that are important in this context.

The selection and evaluation processes act as a kind of 'selective radar' that guides the attention of clients' actors to the type of suppliers' resources and capabilities that are valued in those processes, blocking the acknowledgement or, at least, the valuation of the excluded dimensions. As suppliers' endowment of capabilities and resources does not necessarily coincide with the ones sought by the clients, this may produce a distorted or reduced vision of suppliers' capacities. Furthermore, the relational practices seem to reinforce these processes. The cases suggest that when relationships are close, interactive and stimulating suppliers' initiatives, clients have a more realistic perception of suppliers' capabilities and resources, even if they use them only partially, enabling their subsequent utilization. Thus, the conforming effects of relationships may hinder firms from knowing the actual resources and capabilities of their suppliers, whether because they do not attribute them any value, whether because suppliers do not reveal them. Thus, a narrow and static definition of supplier's selection and evaluation criterion (e.g., if exclusively focused on efficiency dimensions) and the preference for distant relationships dominated by the client may obstruct the recognition of suppliers' contribution potential.

In sum, as the functions that clients seek in supplier are conditioned by the clients' judgment on the latter's ability to perform those functions, the perception and evaluation of resources and capabilities are essential aspects of buyer-supplier relationships. This research shows that there may be a significant gap between the image that clients hold on their suppliers' bundle of resources and capabilities and reality. In this context, supplier selection and evaluation criteria and processes and relationship type appear as important causal factors to this situation, conditioning the perception and evaluation of suppliers' resources and capabilities and, consequently, their use to the benefit of their clients.

## **Main Contributions**

This paper explores the complementarity between the Capabilities Approach and the IMP Approach at several levels. The concept of direct and indirect functions is enriched by the multiple views of capabilities presented here. In fact, the issue of relationships' direct and indirect functions is analysed in the IMP Approach more in the terms of the sources and points of impact of their effects than in terms of the capabilities required to produce them. Möller and Törrönen's (2003) mention to the suppliers' profile of capabilities as a tool to evaluate their ability to fulfil those functions seems rather limited in this context. The association of static and direct capabilities with direct functions and of dynamic and indirect capabilities with indirect functions may contribute to a better understanding of how these functions are produced. In addition, it confirmed empirically that the supplier's profile of capabilities is just one factor, among others, that impact those functions. The client's capabilities

profile is equally important, particularly, its indirect capabilities as its ability to create and mobilize relationships that are adequate to the fulfilling of the desired functions.

The paper also explores Mota's (2000) remarks about inter-firm relationships as mechanisms of coordination and development of capabilities. The analysis of the cases contributed to the extension of knowledge on the connections between relationships' goals expressed in terms of the different types of access of suppliers' capabilities and the organization of that access, namely at the interface, interactivity and information levels. It also helps to clarify how the boundaries of both client and supplier are (re)defined according to the goals settled in each relationship. Finally, this paper exposes the impact of relationship type on the perception and evaluation of suppliers' resources and competences.

For managers, this paper makes clear how the implicit and explicit signs existing in relationships may condition the effective perception and evaluation of supplier capabilities, and thus, the definition of their potential to the client's value creation process. It may also expand the awareness of unexpected and unintended effects that firms' decisions and actions regarding their suppliers may have in the type of value suppliers may add to the client's business. In fact, even dimensions that seem to have clear cut effects, like the definition of selection and evaluation criterion, may have a much wider impact on the interpretation of what is expected from suppliers and how they should behave to strengthen their positioning vis-à-vis the client. A restrictive definition of those expectations (namely by focusing exclusively on rationalization goals) and an over-dominant role on the side of the client may seem (and be) quite effective in the short-run, but may also result in a distorted picture of the suppliers' potential, hindering the possibility of fully exploring that potential to the client's benefit.

Hopefully, it will also help managers to understand how in order to achieve the expected effects in their supplier relationships, clients need to assure that they are doing their part of the job, e.g., they are investing the needed resources, shrinking or stretching firm boundaries, setting the appropriate levels of interaction and providing their suppliers with opportunities to learn and to explore and develop new capabilities and resources. In fact, finding interesting suppliers is just a step in taking the most out of them: being an interesting client and building interesting relationships are also of paramount importance.

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