Chapter 22
Supply Chain Management:
Identifying Innovative Suppliers

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ABSTRACT

The main purpose of this chapter is to develop an exploratory proposal for identifying innovative suppliers, creating knowledge in an area not very deeply explored. Based on a literature revision based on the innovative supplier identification and management, the study suggests that innovative suppliers are highly specialized and technically competent companies, located nearby their customers and take part on their client's improvement program. Based on the literature revision, a framework analyzing client-supplier relationships throughout the supply chain is proposed. The framework uses the strategic alignment concept between clients and suppliers. Finally, 61 questions were developed to identify the innovative suppliers.

INTRODUCTION

Successful companies tend to be much more outwardly (customer) oriented than inwardly oriented. The more customer-oriented firms are, the more likely to innovate and develop new products and services that are valued by their clients. However, being customer orientated, in order to encourage and boost firm's innovation activities, is not enough when suppliers represent the largest share of value delivered to the customer, when the supply chain's fragmentation goes well beyond the production and logistics outsourcing, and when suppliers have to bear more design and development responsibilities than ever before (Wagner, 2009).

There are innumerous ways in which companies can promote, request, implement and reward innovation along with their suppliers. The encouragement of the suppliers' ideas may begin with standard channels. However, wide approaches and impersonal connections may only be the first step to boost the supplier's innovation capacity (Wagner, 2009).

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In spite of the importance of selecting suppliers for the implementation of innovative activities, firms are traditionally very limited on their evaluation of the technological and business capabilities of their suppliers. A supplier should understand, for instance, its client market positioning or the social and economic trends that shape the buying behavior of the end customer. The supplier customer orientation has a significant impact on the innovation capacity, as well as on the cost and speed of its new product development (NPD) projects. Both result on competitive advantages and financial profits.

Firms need to increase their supplier selection process and evaluate how clients understand their suppliers throughout the supply chain. However, there is an important question: how does one identify suppliers? The present chapter aims to answer this main question. The chapter also aims to address the following more specific questions that are related with the previous one: what are innovative suppliers?; what is their role?; how to select innovative suppliers?; How to manage innovative suppliers?; how to increase the supplier innovative capacity?

The additional contribution of this chapter focuses on the supplier innovative capacity to establish partnerships and to cooperate with the clients, on an area very little explored academically. Moreover, the client-supplier relationship can be explored in order to analyze how both firms are strategically aligned and if they follow a relational perspective.

The chapter is composed of seven sections. After the Introduction, which includes the first section, a review of the concept of innovative suppliers is covered in the second section. While the third section examines how to identify innovative suppliers, the fourth section discusses the management of innovative suppliers. The fifth section addresses how to increase the innovation capacity of suppliers. In the sixth section an operational exploratory framework is proposed in the form of a questionnaire. Finally, in the seventh section the conclusions are drawn.

INNOVATIVE SUPPLIERS

The word innovation means renovation, newness. It has a dynamic meaning, related to something that did not exist. In business, the term innovation is related to the object of change, and it can be associated to something new to the world or new to the firm (Schiele, 2006). The innovation theme has been widely explored and analyzed according to many perspectives, and it has been indistinctly associated to products, services, values and characteristics (Moreira, 2011). The OECD, conscientious of this situation, and of the problems related to it, published the Oslo Manual (OECD, 1997) where they explain some of the conceptual aspects on the many types of innovation. Although there are many typologies associated to it, Moreira (2011) presents a multifaceted characterization of innovation, following a traditional perspective at product, process and organizational level.

In any case, innovation is frequently the result of a dynamic entrepreneurial perspective. Several definitions of business innovation (Kimberly & Evanisko, 1981; Van de Ven, 1986; Bolton, 1993) focus on its entrepreneurial nature (ideas, programs, structures, and processes) and, on the other hand, on the fact that innovation presents something new for the organization adopting it (Zaltman, Duncan, & Holbeck, 1973). Innovation is clearly linked to change processes. Also there are those who focus on the characteristics of the adoption process (Sabherwal & Robey, 1993) and on the changing process itself (Van de Ven & Poole, 1995). Although there are studies on project management, knowledge management, among others, Ingham (1994) has analyzed innovation from a business cooperative perspective.

Taking into consideration the main goal of this chapter, it is convenient to offer a more objective definition of the term, i.e., to look at innovation as something new to the firm, independently of being new to competitors or not. The result of a NPD process, the introduction of new product functions or simply the replacement of one of

its materials, as well as the introduction of new machines or technological systems are innovations according to this perspective (Schiele, 2006). For this to happen, apart from the inputs of internal and downstream partners, upstream business partners can develop a very important role. Therefore, selecting and the maintaining the right suppliers, which can effectively contribute for the firm's innovation, becomes a new important task for the purchasing/sourcing department (Schiele, 2006).

Innovation, as an inter-organizational feedback process, can be the result of a systemic perspective (Edquist, 1997; Freeman & Soete, 1997; Håkansson, 1989; Porter, 1990). Porter, 1990). Following the premise that firms almost never innovate on an isolated manner, they cooperate with other organizations in order to win, develop and share several types of knowledge, information and other resources on the search for innovation. Traditionally, innovation has been considered as the result of one person or a firm product; however, the relevance is on the innovation network. An innovation network occurs when different actors from different organizations, with different and distinct knowledge bases, combine their competences to improve an existing product, or a process, or even develop a new product or a new process (Schiele, 2006).

Nowadays innovation is recognized as one of the leading ways of generating competitive advantages in businesses. On the other hand, the generation of innovation is increasingly seen as a collaborative process involving different stakeholders, both internal and external to the organization (Roy, Sivakumar, and Wilkinson, 2004; Ozman, 2009; Berghman, Matthyssens, & Vandenbempt, 2012). Based on this perception, several studies address the influence of the stakeholders in the supply chain in the innovation process of organizations (Roy et al., 2004; Golgeci & Ponomarov, 2013; Ageron, Lavreste, & Spalanzani, 2013; Narasimhan & Narayanan, 2013; Oke, Prajogo, & Jayaram, 2013).

However, the relationship between innovation and the supply chain is a subject that has recently been addressed and is still relatively unexplored (Golgeci & Ponomarov, 2013; Henke & Zhang, 2010), with few studies showing the main factors that positively influence as facilitators, or negatively as barriers to the innovation process.

The main question is clearly on the way companies organize themselves on the creation and internalization of innovation, which requires different answers and organizational processes.

Based on the attempt to understand

1. Innovation as something new to the firms involved,
2. The typical incremental path as an innovation form,
3. The result as a joint supplier-client relationship, the expectations of an innovative supplier are operated through the following items (Schiele, 2006):
    a. The supplier capability to develop new products or of making changes on existing ones;
    b. The technology capability of the supplier processes and its availability to use that capability;
    c. The supplier willingness to share key technological information that the client wants to use and/or master;
    d. The supplier relational capability and willingness to support and improve cooperative NPD processes.

A supplier that evolves to a relational perspective with its client either in terms of innovation or NPD processes creates a very particular image: a firm that has had the capacity to reach the status of an innovative supplier, i.e. and specialized, technically competent firm, close to the client that has the capacity to participate in partnerships based on its client innovation and development programs (Moreira, 2005a, 2005b). For this evo-

lutionary change to occur, the intensity and trust of this relationship needs to evolve over time (Schiele, 2006).

The buyers may want to become "preferential clients" of valuable suppliers, ensuring their primary commitment, which implies that some manufacturers need to be a sort of supplier of its supplier (Wynstra, Weggeman, & Van Weele, 2003). However, by analyzing the main characteristics of innovative suppliers, a single characteristic stands out: there might be a limited choice in establishing innovative relationships in the short run (Schiele, 2006).

The main role of an innovative supplier is to support the buyer's innovation process, which implies that new ideas are brought in on a proactive way. However, typically, the producer has already an idea of what the firm wants, but the firm does not find a way to make its idea happen or simply, its goes far beyond its core competences, which facilitates the supplier to play a more active in the relationship with its client (Schiele, 2006).

HOW TO IDENTIFY INNOVATIVE SUPPLIERS

There is a short supply of articles addressing the main characteristics of innovative suppliers. There are, however, three main research strands that may help providing a perspective on how to identify innovative suppliers (Schiele, 2006):

1. The involvement of the purchasing department on the development of new products;
2. The early involvement of the supplier in NPD processes; and
3. The supplier selection.

According to Schiele (2006), although the conditions in which the purchasing department is involved in the development of new products have been studied (McGinnis & Vallopra, 1999; Nijssen, Biemans, & Kort, 2002; Wynstra et al., 2003), the identification of innovative supplier has not been explicitly addressed. This research strand highlights the importance of the purchasing involvement in NPD (Schiele, 2006). Clearly, the early involvement of both the buyer and the supplier are intertwined as without the supplier involvement, the contribution to innovation is limited (Schiele, 2006).

The integration of suppliers has normally been analyzed taking into account existing projects disregarding the purchasing role in the selection of right partners (Schiele, 2006). The importance of a face-to-face communication is frequently understated, once the suppliers with better communication skills are more likely to contribute to the client's innovation performance than those from more remote locations (McGinnis & Vallopra, 1999; Ragatz, Handfield, & Scannell, 1997). As referred by Schiele (2006), the more closely located the suppliers and their clients are, the more efficient the innovation processes between them.

The supplier selection criteria have not changed through times, without considering the geographical aspects, which have gained more emphasis due to the just-in-time supplying strategies adopted by many large companies (Weber, Current, & Benton, 1991). The supplier selection literature focuses mainly on price, product quality and delivery reliability. According to Schiele (2006), supplier evaluation and selection should be differentiated according to the type of supplier as is the case of supplier selection involving innovation requirements, at product or at process level. The power of innovative suppliers has been gaining an increasing attention as an important element of supplier selection, at least among large firms (Schiele, 2006).

As referred by Schiele (2006), neither the academy nor the business world have provided conclusive tools that may help to identify innovative suppliers as the selection of the suppliers contributing to the innovation process is basically done based on intuition and good luck, without any systematic analysis or previous

planning. In situations in which innovation plays a clear competitive role in generating internal, as well as external advantages, a thoughtful selection of innovative suppliers is extremely necessary.

HOW TO MANAGE INNOVATIVE SUPPLIERS

The supplier management strategy is implemented by the firm to improve its supplier performance and capacity so that the firm can fulfill its short and long term supplying needs (Ndubisi, Jantan, Hing, & Ayub, 2005).

The firm manages its relationships with its suppliers not only individually but as a whole, developing a relational portfolio with their suppliers in order to achieve an optimized supplier base (Wagner & Johnson, 2004).

Strategic supplier portfolios allow the firm to take into consideration the interdependencies between the several relationships with their suppliers, as well as the compensations in terms of risk, competences and other characteristics. The attribution of a selective management capability, administrative staff, time and financial resources to the supplier portfolio of relationships allows the firm to preserve and optimize its limited resources. In order to understand the potential benefits of the supplier portfolio, firms must understand and develop key tools that involve the evaluation, development, and integration of the suppliers (Wagner & Johnson, 2004).

The portfolio management perspective helps to differentiate the firm and to define priorities in terms of partnership with the suppliers. According to Wagner and Johnson (2004), the supplier portfolio configuration and strategic management involves the planning, implementation and monitoring and control of all the relationships with the specific intent of contributing to the accomplishment of its strategic goals.

As argued by Wagner and Johnson (2004), the supplier portfolio management must involve the formal planning of activities allowing anticipating positive, successful outcomes. Their study notices that firms frequently distinguish between two types of planning activities: one related to the supplier definition and another where it is defined the ideal strategy for each individual relationship with the supplier base.

In accordance with Wagner and Johnson (2004), the starting point of the supplier portfolio strategic planning involves the definition of the composition of the supplier base, i.e. the definition of the suppliers the firm want to work with in the future. This way, firms try to create its portfolio defining their existing or future needs and looking at the strengths of existing or future suppliers (Wagner & Johnson, 2004). After this, firms should question how they would work with each supplier in the future and identify the type and the configuration of each individual relationship for each supplier.

The implementation step, which involves the approval or the execution of the strategic supplier portfolio plan, is composed of three sub-processes (Wagner & Johnson, 2004):

1. Supplier base configuration,
2. Supplier development, and
3. Supplier integration.

The configuration of the supplier base involves not only its improvement, but also a wide variety of problems related with the individual suppliers. In general, this configuration involves a number of sub activities that include reducing of the number of suppliers, segmenting the supplier base and evaluating and selecting suppliers (Wagner & Johnson, 2004).

The set of growing expectations, NPD strategy and the advent of the network of suppliers have led many firms to work with a reduced supplier base, but more intensely. Many companies reduce the

number of suppliers by cutting on the number of components, i.e., the strategy of the product ends up conditioning the segmentation of the supplier base. However, it is necessary to take into account the fact that some suppliers may lack the improvement capability to meet new requirements.

Generally, firms must strive for a relational perspective and not a transactional one. However, due to the hypercompetitive world, some suppliers may interpret that their bargaining power has increased, given that the client firm now has a bigger dependency of very few suppliers. As such, it is necessary that firms support their suppliers for a long term relationship, far beyond the short term contractual requirements. As a result of the relational perspective, flexibility, information exchange and innovation are fed within the supply chain (Fawcett, Jones, & Fawcett, 2012).

The segmentation of the supplier base involves the following factors: performance of the suppliers in terms of technology, quality, logistics, price, purchased volume, or strategic importance. The criteria used in evaluating and selecting suppliers may vary, mainly due to the different requirements that firms face, being the lowest price the most predominant one (Wagner & Johnson, 2004).

The managerial options when firms conclude that existing portfolio, supplier performance and business relationships do not fulfill their strategic goals and future needs include three types of solutions: the termination of relationships, the search for new suppliers or by vertically integrating upstream activities. According to Wagner and Johnson (2004), the option for a supplier development program is a very important alternative.

Beyond these segmentation questions, the absence of strategies among partners in the supply chain (Narasimhan & Narayanan, 2013) and the difficulty of integrating their knowledge (Narasimhan & Narayanan, 2013; Moreira, 2009) also create barriers in the creation of a fruitful relationship based on innovation throughout the supply chain.

Incentives are normally used in order to assure that suppliers are actively involved in development programs. They include financial incentives and implicit or explicit promises of repetitive involvement and business continuation (Wagner & Johnson, 2004).

Traditionally, it is necessary to use supplier development programs, not only because of the lack of intrinsic resources, but also for the difficulty or complexity of reaching a relational integration with their partners within the supply chain (Kim, 2009). Sustainability is a very important factor that contributes for the success of the supplier development. It involves the assurance that the programs and activities are continued, consistently integrated and implemented.

Supplier integration involves the strategic integration of both buyer and supplier resources, as well as the restructuring of all relevant supplier-client activities. According to Wagner and Johnson (2004), businesses distinguish between two approaches when their suppliers are strategically integrated with their internal processes. First, buyers and suppliers create market oriented innovative products in the NPD phase. Second, in the manufacturing stage, the suppliers are closely incorporated in the continuous improvement efforts of the production and logistics processes.

The integration of suppliers in the NPD phase is important as firms can extend NPD activities upstream in the value chain. They normally involve jointly supplier-client activities such as concept, design, engineering, production and sourcing that integrate the client internal resources with the supplier critical resources (Wagner & Johnson, 2004).

According to Wagner and Johnson (2004), early supplier integration is vital as suppliers experience a strong feeling of ownership, becoming much more trustworthy, which helps in boosting a trust-based supplier-client relationship, assuming bigger design responsibilities and improving inter-organizational learning (Moreira, 2005b).

Businesses recognize their competitive advantage improve when they extend NPD capabilities across organizational borders. Suppliers improve the client's project and product success by contributing with their innovation and NPD capability. With the strategic integration of the suppliers at the beginning of the NPD phase instead of working on their own, clients have the following benefits: better costs management; improved product quality; easier the product approval; more focused the production planning; and improved time to market (Wagner & Johnson, 2004; Kim, 2000; Moreira, 2005b).

The different roles suppliers play, in terms of risk and responsibility, can help to define the buyer's priorities and resource allocation (Wagner & Johnson, 2004). On the other hand, the methods and goals for supplier integration during the product development phase are different from those during the manufacturing phase. The development phase emphasizes NPD-oriented activities while supplier integration during the manufacturing phase involves transactional improvements throughout the supply chain (Kim, 2000; Wagner & Johnson, 2004).

As the sourcing strategy affects inventory turnover rates the following characteristics are mandatory for both, the supplier and the client: integrating information technology, communicating frequently, sharing knowledge and working jointly as partners. Besides, partnering with a single supplier helps firms to reduce inventory levels, reducing inventory costs (Wagner & Johnson, 2004).

Wagner and Johnson (2004) stress the importance of strategic supplier portfolio monitoring and control. Monitoring focuses mainly on both goal-oriented management and on the creation of an early warning management tool that continuously monitors performance, which must be defined in the planning stage. Several types of supplier portfolio planning and control management systems have been observed (Wagner & Johnson, 2004). For example, measuring outputs (for example, the R&D reduction costs due to R&D supplier involvement), behaviors or actions are among the most common ones.

According to Wagner and Johnson (2004), control and monitoring systems must be flexible enough so that firms can react to unplanned circumstances and must be timely provided so that managers can react on time, initiate corrective actions and adjust the supplier portfolio plans. They must also provide a real image of the performance of the managers responsible for the relationships with suppliers as well as for the supplier portfolio. A relational perspective helps on the alignment of both partners (Oke et al., 2013).

Clearly, supplier management is an important strategic component for the firms' global success. It must be planned, implemented, controlled and monitored.

HOW TO IMPROVE THE INNOVATION CAPACITY OF THE SUPPLIERS

Although it has already been identified that innovation is one of the basic premises for firms to build a competitive position in the market, businesses not only benefit from their internal capabilities, but also identify and take profit from a wide variety of external innovation sources (Chesbrough, 2003).

Among these external sources, suppliers have a principal role once they know what their customers are doing and what their needs are. However, there should be some available mechanisms that allow the transfer of innovation from suppliers to their customers (Kim, 2000; Modi & Mabert, 2010).

Henke and Zhang (2010, p. 41) tried to answer the following question: "How can a customer collaborate with a supplier more, while competing with it less, to increase the supplier's innovation-related activities?"

Competitive Activities of the Clients

In order to promote the transfer of innovation among partners supplier-client relational activities need to be built on trust (Henke & Zhang, 2010; Moreira, 2005a). However, supplier-client competitive activities may result on distrust, which can negatively affect those transfers. What is important is that managers of both firms can work together in order to provide the highest-quality product. Moreover, both firms ought to try to generate win-win situations, so that they generate mutual trust. For example, when the client requests systemically the same supplier for price reductions, or specific investments on technology, both firms might end creating a win-lose perspective if they insist in reaping the benefits out selfishly, which would generate stress, and undermine any relational effort, generate distrust and lead to the deterioration of the supplier-client relationship (Henke & Zhang, 2010; Fawcett et al., 2012).

There are three predominant activities that cause a negative impact on supplier-clients relationships (Henke & Zhang, 2010):

- Conflicting goals among the client's functional areas that may compromise the supplier position;
- Excessive, sometimes late, engineering specifications or changes solicited by the client to the supplier without taking into consideration the necessary resources or a reasonable completion date;
- Unilateral price-reduction requests to suppliers, which only consider the competitive and financial needs on the client, disregarding the financial or competitive position of the supplier.

Conflicting goals are very common among industrial companies, when purchasing activities, consistently with their typical function, try to keep their costs whereas engineering activities try to keep a solid reputation based on high-quality products. This is common especially among traditional industrial firms such as the footwear and metallic mechanic companies or when the communication between these two functional areas is limited or nonexistent (Henke & Zhang, 2010).

The same occurs in many service firms that need to involve different functional areas on the project specification. The main problem is that these conflicting goals among internal functional areas of the firm can create considerable tension for the supplier. This stress may have a negative impact on the supplier's willingness to bring new innovative ideas to the client (Henke & Zhang, 2010), to create trust among partners (Fawcett et al., 2012) and to involve itself on long term relationships (Moreira, 2005b).

Quick changes due to market conditions, the need to create new products, upcoming of new competitive activities or even unplanned things can lead to the development of new business opportunities that may result on the need to quickly change the established specifications that had been evolving over time. The supplier, as the final link of the supply chain on new product development activities is many times put under great stress, as demands normally result on additional unrecoverable costs and lack of time for testing and validation of those changes for the client's benefit (Moreira, 2005b). As a whole, engineering changes and late specifications may create such a stress level that the supplier-client relationship suffers some erosion, even when the timetables are met. Also, frequent delays on engineering specifications or on the specification changes can have a negative financial impact on the supplier, as well as some resentment on the client. The lack of a relational relationship makes the supplier interpret the client's demands as a selfish behavior, which reflects the lack of care of the client with the impact provoked on the supplier and on its resources, as well as the lack of commitment of the client (Oke et al., 2013), which is typical on transactional relationships and not on partnerships (Moreira, 2005b). Afterwards, any commitment from the supplier on its business relationships with the client will

be diluted, as well as the supplier's willingness to transfer innovation to its client (Henke and Zhang, 2010; Oke et al., 2013).

The client's pressure on price reduction must be applied cautiously as it can generate win-win or win lose situations. When applied coherently in a trust-based supplier-client business relationship it generates win-win relationships. However, when the client decides to use its bargaining power and demands a price reduction unilaterally, it just generates a win-lose situation. Once again, the relational perspective must supersede the transactional, adversarial one.

Clearly, resorting to adversarial price reductions usually results in a negative impact on the long-term supplier-client relationship, with both parties being dissatisfied: the supplier normally interprets that the client is not truly committed to a partnership-based relationship, while the client interprets that the supplier lacks the commitment on the supplier-client relationship (Henke & Zhang, 2010).

Cooperative Activities with the Client

According to Henke and Zhang (2010), there are three specific areas for supplier-client collaborative activities in which the client can reduce the relational stress and enhance the supplier innovative activities:

- Involving the suppliers in NPD activities.
- Sharing information and demonstrating openness with suppliers.
- Working with the suppliers and helping them improve their competitiveness in terms of cost and quality.

According to Henke and Zhang (2010), the supplier willingness to invest on innovation-related activities increases as long as the supplier-client relationship is based on the share of information of the processes both firms are involved with and on mutual assistance.

As the involvement of suppliers in the NPD process may benefit the client shortening the NPD cycle time, diminishing cost and improving product quality (Moreira, 2009), clients can involve their suppliers in several stages of their product's life cycle: from a very early stage, when suppliers can present their design suggestions or being given the complete responsibility of the project, to later stages, when suppliers can help manage the quality of the after-sale products (Henke & Zhang, 2010).

If the strategic alignment perspective is important, the client's internal behavior is crucial in order to understand how the innovative supplier manages its intra-organizational activities. So, it is important to detect the presence of cross-functional teams, how joint-problem solving and the joint planning teams are generated and managed (Fassoula, 2006).

So that the supplier's involvement occurs adequately, it is necessary that the supplier and the client are strategically aligned in their innovation activities (Oke et al., 2013). Accordingly, the share of information regarding their plans and expectations are of key importance for the partnership. Besides, an honest and open communication with the client creates a favorable environment of trust that facilitates and enhances the supplier's commitment to the relationship.

As Henke and Zhang (2010) refer, in order for both the supplier and the client to keep the mutual long-term commitment, they must be willing to support each other even when periodical bad news occurs. In this respect, when the client shows a clear commitment in minimizing the supplier's fear of opportunistic behavior, the supplier will be more open and direct in sharing information with the client. In doing so, an innovation-based partnership is more likely to occur, even when technology-specific assets are necessary, which is good for the suppliers and clients (Henke & Zhang, 2010).

THE BEHAVIOR OF INNOVATIVE SUPPLIERS

According to Henke and Zhang (2010), there are two innovation-related activities that have a strong impact when suppliers support their clients:

- Technological investments to create innovative products or processes to support potential future businesses with the client.
- Sharing technology with a client without the assurance of a purchase order.

Clearly, both innovation-related activities indicate that a mutual supportive set of activities in which innovation underpins a long-term, competitive and trustworthy supplier-client relationship (Kim, 2000; Henke & Zhang, 2010) in which the supplier is well beyond a transactional relationship based on mere costs and benefits indicators. On the other hand, the supplier commitment induces the client to a trust-based, stable relationship, which creates a mutual understanding environment (Henke & Zhang, 2010).

Henke and Zhang (2010) refer that in the automotive industry, the supplier willingness to invest and share technology in the supplier-client relationship is based on the trustworthiness developed over time. In the end the situation is very transparent for the supplier: on the one hand, it can develop its internal capabilities and offer their relational clients a superior manufacturing and NPD capabilities, gaining a long-term differentiation-based cooperative strategy, or instead, it can perform business-as-usual behavior based on a short-term, transactional approach in which cost reduction activities play a critical role.

Clearly, new technologies play a critical role. For example, Henke and Zhang (2010) refer that without the pervasive effect of new technologies in the electronics or computers industry the competitive position of many well-established firms would deteriorate. Moreira (2005b) refers that in the shoe industry the situation might be somehow different, due to the short-term fashion industry perspective. Summing up, in order to benefit from the supplier's innovation-related activities, it is imperative for the client to nurture a long term perspective in the supply chain.

ENHANCING THE INNOVATION CAPABILITY

To Henke and Zhang (2010) it is clear how the client can enhance the supplier innovation capability: the firm has to maximize its cooperative activities with the supplier and minimize any competitive activity that reduces the supplier willingness to innovate. As Kim (2000) said, positive results will be reflected in the supply chain. If the supplier and the client are not successful, positive results will not be reflected at all, and a new partnership perspective would be necessary.

In order to maximize collaborative activities, it is necessary to create an environment in which the supplier is willing to make client-oriented innovation-related investments. On the other hand, the supplier must perceive that its relationship with the client is reasonably stable and will last long enough to recover its investments. The supplier should also be aware that the client's innovation knowledge does not deter the supplier's competitors (Fawcett et al., 2012; Henke and Zhang, 2010).

Under these circumstances the supplier's innovative activities occur as a response to the cooperation initiated by the client. Over time, this behavior convinces the supplier that the client is committed to creating a trust-based business relationship. The supplier's trust in future relationships is based on the client commitment, and it is very likely that suppliers and clients will maintain and improve trustworthy business relationships (Henke & Zhang, 2010).

Enhancing the supplier willingness to get involved in a relational activity is very important in the creation of collaborative supplier-client activities as suppliers become more willing to

share their innovations with their clients and more determined in investing in new processes and products, which is important in generating future businesses. Intertwined with this willingness is the supplier's perception that the client is committed to a long term relationship, once the products remain competitive in terms of price, quality and technology *vis-à-vis* other suppliers (Henke & Zhang, 2010).

Trust is very important issue in the supply chain, mostly because the lack of trust jeopardizes a relational relationship (Fawcett et al., 2012). Trust is especially important for the supplier, given that the client can easily share information with the supplier's main competitors, in the hope of finding a less expensive supplier or someone that can provide an equally high-quality product or service. As such, it is natural that suppliers are reluctant in sharing knowledge with the clients they have an uncertain relationship with. Under this perspective, the client has a lot to lose if it cannot achieve the supplier's trust (Henke & Zhang, 2010), as it would not be possible to integrate this relationship in the supply chain (Kim, 2009) and knowledge will not be shared between the two companies (Moreira, 2009; Narasimhan & Narayanan, 2013).

In order to maximize trust and commitment, competitive activities must be minimized. However, the client's need to pressure its supplier base for costs reduction activities is dictated by the reality of the global business environment. Suppliers must be aware of this constant pressure. However, if a price reduction pressure over the suppliers is applied coherently and based on a trustworthy relationship, its impact will be minimized and the relational stress reduced (Henke & Zhang, 2010).

Due to their relationship in the supply chain, the innovative supplier and the client need to be aligned at an organizational level, given that the results of their joint work result from a structure that involves several departments in both organizational structures of the supplier and the client. The relational perspective is clearly the result of a process-based organization that involves: multifunctional, interdepartmental and inter-organizational organizational knowledge-based activities, and a matrix or process-oriented organizational structure (Lambert, García-Dastugue, & Croxton, 2005; Moreira, 2005b, 2009).

If the strategic alignment perspective is important, the client's internal behavior is crucial in order to understand how the innovative supplier manages its intra-organizational activities. So, it is important to detect the presence of cross-functional teams, how joint-problem solving and the joint planning teams are generated and managed (Fassoula, 2006).

The supplier-client relational perspective is crucial to avoid the classical opportunism of win-lose transactions. As such, boundary spanning activities are important for the development of a relational perspective in the supply chain (Tracey, Lim, & Vonderembse, 2005). Given that, it is necessary to anticipate how both teams share their goals, share information about their costs, share their profit improving activities in their relationship throughout the supply chain, share problem-solving methodologies, and participate in joint improvement planning activities, as these activities are only achieved when both firms work under a relational perspective (Reichhart & Holweg, 2007).

The firm's top management involvement is necessary for a relational partnership in the supply chain (Fawcett, Ogden, Magnan, & Cooper, 2006). This involvement includes the definition of clear internal goals, the staff participation, the allocation of resources and the recognition of the importance of the supply chain management (Fassoula, 2006; Soosay, Hyland, & Ferrer, 2008).

Finally, a performance related topic must be referred to when addressing the importance of the supply chain management. As such, in order to achieve a high involvement in the supply chain, it is necessary to know if suppliers and clients have common strategic goals and how they define and implement them at intra- and inter-organizational level (Chan, Qi, Chan, Lau, & Ip, 2003).

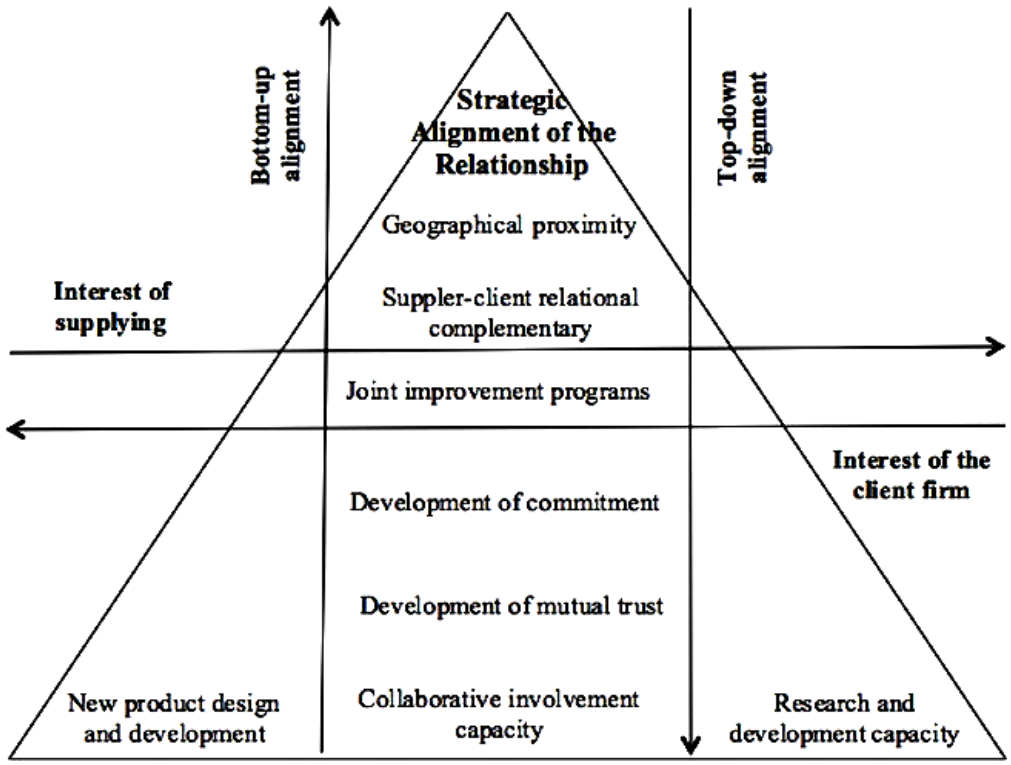
As if it depended on what was referred above, the developmental perspective of innovative suppliers in the supply chain is wide and multifaceted. To expect that partners develop their own good will is, at least, naïve. It is necessary to define a cooperative strategy involving the client and the supplier, so that the strategic alignment both parties could be achieved.

Among several conflicting activities of supplier-client relationships – e.g. the definition of goals, and the technical and engineering differences – specification changes are harder to control due to their financial repercussions. These activities are clear symptoms of systemic problems within a firm that are not susceptible of being solved without a process or procedural changes that throughout times become firmly embedded in the firm's operations. A relational perspective in the supply chain is mandatory in order to have the perception of the frequency and intensity of those problems, as firms need to make changes to correct them so that the relationship is not doomed (Kim, 2009). Meanwhile, the client must reward the supplier for its collaborative efforts. By doing that, the relational stress will be lessened and it will increase the supplier willingness to invest on innovation (Henke & Zhang, 2010).

Schiele (2006) proposes a framework to identify and choose innovative suppliers, based on eight propositions, which involve the supplier, the supplier-client relationship and the supporting factors.

Collaborative activities in the supply chain normally lead to supplier-client relational strategic alignment that involves the share of information across both organizations. They involve more and deeper commitments, mutual participation in the NPD process, continuous improvement and long-term strategic perspectives that involve some horizontal and vertical flows as proposed in the framework presented in Figure 1.

Figure 1. Supplier-client strategic alignment in the supply chain



The proposed framework for increasing supplier innovation and its associated recommendations reflects the importance of the supplier-client strategic alignment in the supply chain (Oke et al., 2013). By following these recommendations, clients can assure the maximization of their opportunities in obtaining their suppliers knowledge, competences and capabilities, enhancing their competitive advantages in the market and reinforcing their business relationships with the supplier (Henke & Zhang, 2010; Oke et al., 2013).

As shown in Figure 1, horizontal arrows involve horizontal relationships – from upstream to downstream, and vice-versa – in the supply chain, which implies a relational supplier-client perspective, based on trust and commitment. On the other hand, vertical arrows aim at transmitting that, from a bottom-up, top-down perspective, the final goal of the client-supplier relationship is the strategic alignment between both firms, which will be reflected on the relational characteristics of the base of the pyramid.

Clearly, the client-supplier relationship has to be based on a long-term relational perspective, so it does not feed the relational stress. On the other hand, R&D and NPD capabilities and collaborative perspectives have to feed the development of trust and commitment, on a continuous improvement perspective that boosts the supplier-client relational complementarity and strategic alignment. Once that both partners are strategically aligned, facing future perspectives, it is necessary to synchronize the new R&D competences in order to create a dynamic, future cooperation.

EXPLORING THE FRAMEWORK PROPOSED

The present section aims to propose an exploratory operational framework that allows the identification of innovative suppliers throughout the value chain. For that, it is going to start with the Schiele's initial proposal (2006), which will be complemented with the bibliographical revision previously mentioned. This way, in order to get a better definition of the mentioned phenomena and deepen the referred theme, we aim at giving the initial step on this research process by proposing a number of questions that allow obtaining information of the innovation potential of the suppliers within the supply chain, even though in an exploratory way.

The questionnaire focuses on industrial firms, in order to allow a relational perspective within the supply chain. Its context is not yet defined at this stage, but it could be addressed during its implementation. Taking into account the emphasis given to NPD in partnerships involving innovative suppliers, the proposed questionnaire follows a product innovation perspective.

For each proposition a set of open questions would be proposed so that each proposition can be addressed independently. After an analysis of each proposition, the whole perspective can be addressed altogether.

Proposition 1: Specialized firms are more innovative than generic firms supplying several industries.

As referred before, firms tend to take more profit from cooperation, in terms of innovation, if they are aligned throughout the value chain, and if they have a certain level of complementary specialization and know-how. In the same way, the supplier capability in finding a solution for a certain type of problem according to the specifications demanded by the client is an important element that has influence on the innovative result.

To confirm the present statement, it would be relevant to check out the firm's main business activity, framing and understanding it from a certain business context. With the aim of determining its level of specialization, it would be relevant to question firms if they are inserted on a certain business group, their business activities level of diversification and if they invest on innovation

activities, such as external R&D acquisition, specific equipment of internal R&D, acquisition of machinery, equipment and software, external knowledge acquisition, among others.

Main questions to be addressed:

Q1: What is the firm's main activity?
Q2: What is the firm's main business?
Q3: What is the turnover?
Q4: What is the total number of employees?
Q5: Is the firm part of a business group?
Q6: If the answer is yes, in what country are the headquarters located?
Q7: What is the group's name?
Q8: Indicate the geographical markets for the sale of the firm's goods?
Q9: Has the firm diversified its businesses? What are their levels of specialization?
Q10: How much does the firm invest in innovation activities?

Proposition 2: The higher the R&D capability of the firm the more innovative the firm is.

The supplier's research and development activities, as well as the other technological activities, were identified by Schiele (2006) as innovation determinants of a supplier. If the client understands that the supplier's resources and capabilities are not enough, the cooperation is doomed. The identification of innovative suppliers includes the evaluation of their design and NPD capabilities, their process and product know-how and quality certifications obtained.

In order to determine the firm's internal development capability, the existence of an R&D department should be addressed, as well as the number of permanent staff and their skills. It is equally relevant to address how innovative the firm has been, as well as what measures it has been taken to protect its inventions (patents, brands, copyrights, among others).

Main questions to be addressed:

Q11: Does the firm have a R&D department? How is named and what is its main activity: Research, Innovation Development?
Q12: How many employees are involved in these functions?
Q13: What is the employees' educational level?
Q14: What is the R&D investment vs. sales volume ratio?
Q15: In the last year, has the firm introduced new or significantly improved goods?
Q16: Write a brief description of this new or significantly improved good.
Q17: What is the total number of new goods?
Q18: How many patents does the firm have?
Q19: How does the firm protect the innovations developed?
Q20: What are the main modalities?
Q21: What is the level and amount of expenditures with those modalities?
Q22: Does the firm yield from technology transfer agreements? If so, quantify the revenue?
Q23: How much does the firm expends in the acquisition or exploration of patents and / or technology transfer licenses?

Proposition 3: Innovative suppliers are involved in several cooperative projects at the same time.

Due to their intrinsic competence, innovative suppliers tend to develop several cooperative relationships. The firm's previous cooperative experience with a supplier can be seen as an indicator of its innovation ability. This way, it must be investigated if firms establish cooperative partnerships; if they do, with whom and how often.

Main questions to be addressed:

Q24: Who is responsible for the product innovation, the firm or the supplier?
Q25: In how many partnerships is the firm involved?
Q26: Please indicate the types of partnerships the firm has been involved with.

Q27: Please indicate the type of cooperation partner that was more important for the firm's innovation activities.

Proposition 4: The client benefits from a relationship with innovative suppliers when based on trust and commitment.

Trust is a previous condition for the disclosure of information when someone is involved in a cooperative agreement aiming at generating innovation. Besides this, trust reduces the monitoring costs, which is a typical problem in the development of new products when the tasks are to be carried out by the supplier. Trust can lead to a pro-active behavior encouraging the supplier in the presentation of new ideas.

Based on Sako's (1992) three different types of trust –contractual trust (delivering the good or service), competence trust (the supplier capability to fulfil the expectations) and goodwill trust (the commitment to do more than what is expected) firms can be asked about their demands for the relationship (for example, certification, audit procedures, NPD, R&D processes or activities, deadlines flexibility, after-sale procedures, among others), their understanding of the concepts of trust and commitment, and what can affect the trust and commitment of the suppliers.

Main questions to be addressed:

Q28: What are the firm's demands for the relationship with its suppliers?
Q29: What does the firm understand by trust and commitment regarding the relationship with its suppliers?
Q30: What are the characteristics that the supplier must have so that the firm can trust and compromise with it?
Q31: What can jeopardize the firm's trust and commitment in its relationship with its supplier?
Q32: Do you trust the supplier with whom you cooperate/have a partnership with?
Q33: Do you intend to keep your partnership with your supplier?
Q34: Are you willing to do any efforts in order to keep your relationship with your supplier?

Proposition 5: Innovative suppliers participate in joint improvement programs with their client.

The quality of a supplier-client relationship is also very important for supplier development programs. As improvement programs only work if supplier-client mutual acceptance is based on trust and commitment (Shiele, 2006; Handfield, Krause, Scannell, & Monczka, 2000) supplier development programs need to be developed to increase the innovation both at product and process level. These development programs may involve active or passive measures, with the former having a greater effect on innovation. Active supplier development programs may include supplier personnel development and support programs, sending of resident engineers to the supplying firm or the joint execution of improvement projects. On the other hand, passive supplier development programs include supplier assessment mechanisms based only on self-improvement strategies.

The present proposition aims to question if firms are involved in joint development programs with their suppliers and their active or passive availability to do so.

Main questions to be addressed:

Q35: During last year, were you involved in any joint improvement or development program with your suppliers?
Q36: If the answer is yes, with which suppliers?
Q37: On which way?
Q38: If the answer is no, would you be willing to develop a joint program with your suppliers?

Proposition 6: Successful suppliers cooperate with the client during the innovation process, and are normally located near by the client firm.

According to Schiele (2006), face-to-face communication, involving several people, is very common on innovative relationships, which gives locational proximity an increasing importance in the supplier-client relationship. This direct communication is facilitated if suppliers and buyers are geographically next to each other, which underpins the transfer of tacit knowledge through direct contact between the stakeholders involved, and is hardly accessible through digital channels. The outcomes of the client-supplier relationship are influenced by the distance and borders established between both parties.

To operationalize this proposition, it is necessary to address the geographical distance between the location of the suppliers and their partners.

Main questions to be addressed:

Q39: What is the geographical location of your main partners?
Q40: What is the geographical location of your suppliers?
Q41: What are the partners your firm has had innovation activities with? In what way distance plays an important role?
Q42: If you have nearby partners, in what way are they more innovative than distant partners?

Proposition 7: The client is important for suppliers with innovative potential.

The supplier-client relationship has to be looked at in a bi-univocal, bilateral way, involving costs and limited resources. Accordingly, not all suppliers, or clients, can be included in a cooperative development process or in joint continuous programs. All parties must be aware of the fact that they need to add value to the other party *vis-à-vis* alternative business partners. As such, innovation-based cooperative partnerships should only be established with suppliers that are important for and are tuned with the client, based on a long-term partnership.

According to this proposition, a way should be found to understand the importance of the supplier to the client and how it can gain that importance.

Main questions to be addressed:

Q43: What is the importance of the supplier for the firm, in terms of products and processes?
Q44: How important is your firm for your suppliers, in terms of products and processes?
Q45: What are the determinant factors for the firm to gain importance among your suppliers?

Proposition 8: The longer the supplier-client cooperation, the better.

As previous experience as a partner is frequently understated as a supplier selection criterion or as a critical success factor in cooperative agreements, Schiele (2006) contends that age is important in cooperative relationships (Schiele, 2006) and age is positively co-related with financial performance and the improvement of the innovative results.

It is mandatory to address the average duration of established partnerships in the past to find out the effect of age of the relationship on the supplier innovative capability.

Main questions to be addressed:

Q46: How long do the firm partnerships with other institutions and/or companies last?
Q47: What is the average duration of the partnerships established by the firm and what are the main differences among them?

Proposition 9: The more strategically aligned the supplier-client relationship, the closer the companies' organizational structures.

In order to find out how aligned supplier-client partnerships within the supply chain are, it is important to analyze how the processes between the two firms are held and how the different departments are involved. If there is an

alignment between both parties, inter-functional activities will certainly be deeper than in non-aligned firms.

Main questions to be addressed:

Q48: How is the intra- and inter-organizational knowledge between the supplier and the client managed?
Q49: Are there any project and post-project follow up meetings?
Q50: What is the type of project organizational structure and what is the consequence for each firm?
Q51: What is the firm's organizational structure and how aligned the project is for both companies/institutions?
Q52: Are there cross-functional teams? How are they managed and which departments are involved?
Q53: Is there any project joint-problem solving going on? Who is involved and what are the results?
Q54: Is there a joint planning going on? What types of activities and what is the degree of success? How are they formalized?

Proposition 10: The more strategically aligned the supplier-client relationship, the smoother the share of information between both companies.

What was referred above regarding firms' organizational structures is still valid in terms of share of information between both firms. Accordingly, if both firms are strategically aligned within the supply chain, the smoother the share of information, the more strategically aligned the suppler-client partnership is.

Main questions to be addressed:

Q55: How are goals shared between both firms? On a project by project basis? Based on business model?
Q56: Is there a share of information regarding costs? Only for certain joint projects?
Q57: Are there any joint problem resolution activities? Are there any specific improvement projects as outcome of joint development projects?
Q58: How involved is the firm's top management, in each firm?
Q59: Does the firm have any autonomy to redefine goals? Is there any autonomy for the allocation of new resources?
Q60: Are there any prizes allocated when results are achieved in joint projects? What is the role of the other party in the partnership?
Q61: Are there any common strategic objectives? How are they defined? On a project by project basis?

CONCLUSION

With the rapid technological evolution and diminishing product life cycles, businesses are embracing an outward perspective in what pertains to research, development and innovation. However, they should be careful when choosing partners with whom they cooperate with.

Cooperating with suppliers brings firms a greater impulse to the product innovation. The suppliers, despite their thin core knowledge base, may have stronger impacts on product innovation, due to the share of information and knowledge. Each supplier may know very little outside of its core product area, but if it works jointly with its client using its skills and competences, the innovation impact can be significant. Partnerships with suppliers build an ideal situation: on the one hand, suppliers already know what their clients are doing and, on the other hand, clients might have already implemented some knowledge transfer mechanisms to their suppliers (Yu, 2008).

Normally, clients adopt strategies in order to evaluate and select suppliers that respond to their requests. In order to build a more effective relationship with their suppliers, firms normally use several supplier selection criteria to reinforce the selection process. However, the supplier selection criteria are changing due to the new challenge that involves the selection of suppliers that can add value to the client in a long term perspective (Ndubisi et al., 2005).

According to Ndubisi et al. (2005), product quality, product costs and delivery performance history are the three main criteria for the supplier selection, product quality being considered the most important one, followed by the delivery performance and product costs. The management of the relationship with suppliers may lead to a differentiation advantage, which may underpin a highly profitable and sustainable competitive advantage. Due to the suppliers' potentially significant contribution to the firm's competitive position, the strategic implementation of the supplier base may bring some real advantages to the firm competences portfolio (Wagner & Johnson, 2004).

Firms must configure and manage the relationships with their suppliers as a relational portfolio, and consider some trade-offs between those relationships, in terms of risks and essential resources. It is necessary to understand the supplier portfolio management as a strategic management process that should include planning, implementation and control activities.

An effective management of the supplier base can include the management of the supply chain costs. By getting involved in NPD activities and in continuous improvement efforts, suppliers will learn the client's requests, its culture and its decision making processes, which allows them to improve and be more effective when working with their customers. These strategies help suppliers and clients to improve their communication, their decision making, their performance, as well as their share of knowledge.

The early involvement of the supplier has other benefits for both parties, as the reduction project cycle time, which leads to a faster product launching.

Suppliers prefer to invest their resources and to innovate with clients that treat them well. An important cause of poor relationships with suppliers is, although frequently neglected, the unfair share of the benefits resulting from joint investments on innovation, known as asset specificity. According to Wagner (2009), if suppliers participate on the creation of value on joint innovation projects, they are more willing to cooperate with their clients in the future. However, it is necessary that the supplier and the client are strategically aligned so that both benefit from a win-win relationship.

Clearly, the main challenge for firms is to develop a relational perspective in the supply chain in order to involve suppliers in stress-reducing activities as well as in innovative added-value activities. On the other hand, clients need to manage their supply base to foster long-term relational activities from their suppliers so that suppliers and clients achieve a relational complementarity. Moreover, the supplier-client strategic alignment will only be achieved when both firms synchronize their collaborative NPD and R&D capacity, their joint improvement programs, trust and commitment, and their relational complementarity.

Although a general perception and a greater sensibility has been gained, the existing literature concerning innovative suppliers is clearly insufficient. The chapter is very restricted due to its complexity. As such, its enrichment would involve the development of a deeper literature review and exploratory research in areas as collaborative NPD, joint quality programs, joint project management, among others, to unveil some important managerial problems.

The implementation of a set of research questions is very pertinent in order to get a better understanding of the reality of innovative suppliers. This should involve clients and suppliers altogether, in order to try to find out their convictions and

expectations, facing both perspectives. Although some dyadic relationships might be assessed, a networked perspective would provide a clearer perspective. It would be equally important to analyze the supplier-client relational difference, in order to realize not only the differences between clients and suppliers, but also how different joint projects differ among themselves.

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KEY TERMS AND DEFINITIONS

Business Relationships: Business relationships involve a formal approach to understanding, defining, and supporting business-based relationships among firms. These types of relationships involve the share of knowledge, skills, competences, technologies in such a way that the activity of one business partner complements the activity of the other party. Normally, these relationships are based on a long-term perspective and involve trust and commitment among the parties involved.

Commitment: Investment and effort spent in order to continue on a relationship.

Innovative Suppliers: An innovative supplier is the result of working collaboratively with suppliers in order to generate profitable value-added activities. It stems from the fact that as companies can rely on a cadre of value-added, competence enhancing suppliers in what pertains to generating innovation, firms can reshuffle their internal capabilities improving differentiation while reducing costs.

Sourcing Innovation: As sourcing involves the procurement process of continuously improving purchasing activities of an organization, sourcing innovation encompasses all institutional activities aimed at procuring innovative, added value activities in order to complement the organization's competences and activities.

Strategic Alignment: Innovation is certainly an important characteristic for firms to achieve competitive advantage. However, for supplier-client relationship throughout the value chain thrive, both the supplier and the client need to be strategically aligned, i.e., they need to be tuned on what information they share, what types of joint products they develop, what responsibilities they share, how they manage continuous improvement, how they define inter-organizational activities, how they deploy cross-functional teams, joint-problem solving and how joint planning teams are generated and managed.

Supplier-Client Relationships: These relationships involve the trust and commitment between suppliers and their clients in the value chain. They are also known as vertical relationships. These relationships are based on the dynamic complementarities throughout the value chain in which an antagonistic perspective between the client and the supplier is abandoned in favor of a more pro-active, value-generating perspective.

Supply Chain Management (SCM): Although in general terms it involves the management of goods, normally it includes the movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin/ manufacturing to end customers. It is very important as it involves the provision of products and services. It might involve a complex competitive infrastructure, complex logistics and the synchronization of the demand and supply. It involves the integration of different organizational areas as operations, logistics, procurement and strategy.

Trust: The belief that in an existing relationship an actor will act and behave in the benefit of both parties.