

A Model for understanding supply chain networks

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Abstract

Organisational performance tends to be highly dependent on suppliers' actions and on the way the relationships with them are managed by the buying company. Researchers have conducted extensive and valuable studies on the impact of supplier relationships in a network context. However, some important issues regarding supply management and its effects on the strategy of the buying firm have not been fully investigated. This article presents a model of supply chain networks developed on the basis of the conceptual framework of the IMP group. The aim is to contribute toward a better understanding of supply management through the integration of both relational, portfolio and network issues.

Keywords: procurement, buyer-seller relationship, competencies

1. Introduction

Technology and globalisation of production and trade are intensifying competition in most industries (UNIDO, 2002). Reacting to this trend, firms are moving towards new cooperative arrangements involving new types of interaction, not only with customers but also with suppliers and other stakeholders (Omta *et al.*, 2002). In general, firms attempt to achieve this through a growing specialisation around their core resources and competencies (Hartmann *et al.*, 2001; Nonaka and Toyama, 2002; Whitley, 2002), acquiring from other organisations goods and services whose production is not based on central competencies (Cousins and Spekman, 2000; Möller and Törrönen, 2000). Flexible supply chain arrangements attempt to achieve leverage of both firms' core competencies and the resources and skills of their partners (Gow *et al.*, 2002). This means that "hybrid forms" tend to gain importance as a governance form lying in the middle between spot markets and vertical integration (Neves, 2003). Simultaneously, the importance of both the value and content of industrial purchasing is pushing supply management to a strategic level (Gadde and Håkansson, 2001; Gattorna and Walters, 1996). Due to specialisation, the activities needed to produce any value offer are scattered amongst a larger number of entities, connected and structured in complex supply chains that Möller and Törrönen (2000) define as value creation networks, which compete amongst themselves (Cousins and Spekman, 2000; Morgan and Hunt, 1994). The evolution of inter-organisational relationships is a cause and effect of redesigning analysis and management models. In this context, the work produced by Lazzarini *et al.* (2001) on netchains is undoubtedly valuable since it integrates the supply chain analysis and the network perspective.

This article attempts to go further, to contribute to a better understanding of supply management through the development of an integrated framework that encompasses the relational, portfolio and network levels. The conceptual background owes much to the work by the researchers of the IMP (Industrial Marketing and Purchasing) group over the past decades (*cf.* Axelsson and Easton, 1992; Ford *et al.*, 1998; Gadde and Håkansson, 2001; Håkansson, 1982; Håkansson *et al.*, 2004; Naudé and Turnbull, 1998). The first section briefly reviews the traditional management perspective and addresses some of its most important weaknesses. The next section elaborates on a number of key issues related to the use of a network perspective in supply chain management. The section which follows presents a model of supply chain networks that results from a reflection on the existing literature and how it can be furthered to explore some relevant issues that still remain relatively obscure. The last section offers some conclusions and a number of suggestions for future research.

2. The traditional perspective

In their book *Principles of Marketing* first edited in 1996, Kotler *et al.* (1999, p. 16) define marketing management "as the analysis, planning, implementation and control of programs designed to create, build and maintain beneficial exchanges with target buyers for the purpose of achieving organisational objectives". They add that "exchange is the core concept of marketing" (*op. cit.*, p. 12) and "transaction is marketing's unit of measurement" (*op. cit.*, p. 13). This concept of marketing does not mean that companies' revenues are restricted to single transactions whose profits should be maximised each time. As a matter of fact, Kotler contends that firms not only want to engage in short-term transactions but also seek

the development of long-term relationships (“maintain... exchanges”).

The problem, as Gummesson (2002, p. 17) points out, is that in transaction marketing when “... a new customer has bought a product [this] does not forecast the probability for a new purchase, not even if a series of purchases have been made. A customer may repeatedly use the same supplier because of high switching costs, but without feeling committed to the supplier or wanting to enter a closer relationship”. In other words, since “transactions lack history and memory... transaction marketing has no ambition to climb the loyalty ladder” (*op. cit.*, p. 17). Moreover, Sheth and Parvatiyar (2000) add that one of the fundamental concepts of transactional marketing is the belief that competition and self-interest drive value creation – the enlarged consumers’ choice created by competition compels marketers to create in their self-interest a more valuable offer.

This view is reflected in the concept of purchasing as a centre of costs of administrative nature (Gattorna and Walters, 1996), whose fundamental task is to choose the suppliers who are likely to provide the greatest financial advantages to the company (Gadde and Håkansson, 2001). The traditional perspective is criticised as it seems no longer possible to assume that markets are dominated by sellers, who define the combination of variables applied to a faceless market that merely responds. This is because both buyers and sellers are interdependent actors whose respective actions are likely to affect the other counterpart (Easton, 1992). Although this also tends to occur at least in some consumer markets as Buttle (2004) shows, business markets are even less fitted to this picture of a faceless world made up of independent actors that exchange goods and services at equilibrium prices (Easton and Araújo, 1994). In fact, buyer-seller relationships are substantially different. They reflect interaction processes through which companies and other actors are active participants in their dyadic relationships established and developed through individual episodes of action and reaction, but integrated in dynamic processes where time plays a crucial role (Ford *et al.*, 1998; Håkansson and Johanson, 1992).

The questioning of both the theoretical and empirical validity of the traditional marketing management model has stressed the need to develop other perspectives. The network approach developed by the IMP group is likely to provide useful insights to understand the complexity of such business realities, in particular in terms of supply chains.

3. A network perspective on supply chain management

Basic Concepts

The network approach developed by the IMP group regards industrial systems in terms of three basic variables: actors, activities and resources (Håkansson, 1987). In industrial networks, actors are those who, being goal oriented perform activities and/or control resources. They can be individuals, firms, groups of individuals, groups of firms or even parts of firms. Embedded in a web of social and economic relationships, actors perform activities by using, consuming and creating heterogeneous bundles of resources which can be controlled either directly or indirectly. The difference between these two types of control is of particular interest since while the former is based on ownership, the latter is achieved through relationships. The importance of indirect control stems from the fact that when an actor establishes exchange relationships with other actors, links of dependence are created and, consequently, their resources come, at least partly, under the control of the focal actor.

In this context, actors tend to be strongly and mutually interdependent, in order to effectively coordinate their resources and activities (Snehota, 2004). The development of relationships is strongly affected by the actors’ views, interests and expectations as well as their mutual efforts in the interaction process, and, as Mattson (1997) shows, interdependence is likely to increase with the deepening of the specialisation process.

From a network perspective, strategy, network positioning and network theory are interrelated concepts that influence actors’ behaviour. Network theories reflect the actors’ visions and intentions in the network. They are influenced by their conceptual frameworks that allow them to understand and act in the network, and to set network boundaries by including/excluding actors. According to Mattsson and Johansson (1992), actors’ positioning is determined by their exchange relationships, and it forms the basis for strategic action. Araújo and Easton (2002, p. 12) contend that positioning *may* be seen as conjectures that actors make about their own roles, which are always subjected to multiple and provisional interpretations that have to be discovered and tested in action. Finally, strategy tends to evolve gradually as firms interact, explore and adapt to new circumstances. Strategic actions translate into actors’ efforts to influence, by changing or preserving, their network positioning. The evolution of network theories, positioning and strategy is conditioned by the firms’ network knowledge, which affects the way they set the boundaries of what they consider to be their relevant network (*i.e.* their

focal net), and the conceptual frameworks that shape their network theories. To assure effective management of their relationships (e.g. with suppliers) companies must have extended knowledge about the networks in which they are embedded (Ford *et al.*, 1998; Möller and Halinen, 1999). At this point, the concept of the netchain introduced by Lazzarini *et al.* (2001) is of particular interest. A netchain is "... a set of networks comprised of horizontal ties between firms within a particular industry or group, such that these networks (or layers) are sequentially arranged based on the vertical ties between firms in different layers" (*op. cit.*, p. 7). The netchain analysis aims at integrating both the supply chain analysis and the network perspective. Such integration is crucial for a holistic understanding of supply management.

Besides the effects of their dyadic relationships, firms also have to contend with the indirect effects of their counterparts' own relationships that flow across the network through interconnected relationships. As Hertz (1992) explains, since each relationship may affect other relationships positively or negatively, the degree of interdependence in a network varies with the content, intensity and symmetry of the relationships.

During the last decade, a number of authors have studied relationship functions and effects, highlighting some aspects of these problems. For instance, Anderson *et al.*'s (1994) distinction between primary and secondary functions may be partially associated with Möller and Törrönen's (2000) definition of direct and indirect effects. Holmen and Pedersen (2003) extended Anderson *et al.*'s notion of indirect functions to the understanding of how direct partners mediate between the focal company and the network. Håkansson and Snehota (1995) argue that, depending on several factors, relationships may produce different effects on both partners involved, but also at the relationship and network level. As Ford and McDowell (1999) contend, relationship effects may be (un)intended, (un)predictable and differently evaluated by participants and other actors; and moving from the relationship to the network level leads to more complex and less immediate effects (Håkansson and Johanson, 1993). These different perspectives and the distinction between relationship functions and effects may help to establish a global framework for relationship potential.

In this context, Ritter (1999) states that it is impossible to consider a relationship in isolation. Firms should also consider the functions and effects they expect to achieve with those relationships and how they may effectively manage them. This means that the selection and management of suppliers should not be reduced to the collection of a portfolio of dyadic relationships. Rather, the interactions between those dyadic relationships must be considered, managed and, in some cases, nurtured.

Networks and supply management

As firms become more specialised, borders between the buying company and its suppliers tend to become blurred. Firms should consider not only the resources and activities they own, but also the resources, activities and actors they control throughout the network. Araújo *et al.* (1999, p. 499) contend that a "firm's competitive advantage resides not only within the frontiers of what it owns and controls, but also on the idiosyncratic interfaces that it develops with other firms, e.g. its suppliers". Less integrated companies feel a greater need to expand their resources through the access and control of suppliers' resources. Managing suppliers must focus on the development of a network of external resources or a supplier network (Gadde and Håkansson, 2001; Gadde and Persson, 2004; Hartmann *et al.*, 2001).

Dubois and Pedersen (2001) illustrate the connectivity present in industrial markets with the network of interdependencies needed to create an individual product. Products can be seen as the output of a given structure of activities and the input of other structures of activities. Acquiring the character of a "network entity", they result from the connections established amongst suppliers and other actors, *i.e.* from the way that upstream activities are coordinated and resources are combined in order to result in specific products. This means that the performance of a supply chain depends not only on the conditions of the firms that integrate it, but largely on the way its activities and resources are related to those of other supply chains (Gadde and Håkansson, 2001). In this scenario, the virtues of buyer-supplier adversarial, competitive and distant relationships are giving way to more collaborative links (Ford *et al.*, 1998). For Hartmann *et al.* (2001), the central issue in purchasing is to determine the type of cooperation a company should develop between itself and its suppliers – and the circumstances under which it should do so. Thus, relationships should be established and developed according to what the buying company expects from them, what is invested in them and what effectively happens in them.

However, the benefits of strengthening relationships depend on the effects of those close and lasting relationships. As Backhaus and Büschken (1997) argue, strong relationships can be seen as assets, but can also represent heavy liabilities to the firms involved. Freytag and Kirk (2001) contend that any client or supplier portfolio is always a combination of transaction and relational markets. In fact, transaction marketing and relationship marketing are part of the same paradigm, since sometimes firms may have only transactions, at other times both transactions and relationships – and at still other times only relationships, without any economic transaction (Brodie *et al.*, 1997).

This idea was developed further by Gummesson (2002, p. 17) who states that "... in order to conceptually incorporate transaction marketing in relationship marketing, it can be seen as the zero point of the relationship marketing scale". At this point, Gummesson refers to Grönroos' (2000, p. 252-253) concept of 'marketing strategy continuum'.

As stated above, however, supplier relationships should not be considered in isolation – they have different functions and effects and their contribution to the buyer performance may be reflected at different levels: buyer, relationship, buyer's relationships portfolio, and network. This means that when supplier relationships have relevant effects, the buying company should reinforce its investment in them. However, relationships depend on the will of both buyer and supplier, and the existence of suppliers that are potentially interesting to the buying company does not necessarily work in its favour. As Easton (1992) argues, actors are not totally free to choose their partners, and relationships cannot be established or developed without the joint effort of at least two actors. The buying company should therefore identify critical actors in the network and analyse how to mobilise them in order to access the resources and activities it needs (Ford, 2002).

On the other hand, mobilisation ability varies according to the company's interacting partners inasmuch as it depends on its positioning at both the network and relationship level (Ritter and Ford, 2004). This means that suppliers differ not only in terms of the type of interest the buyer is looking for and their potential to provide the benefits that go with it, but also on the latter's ability to foster their interest and investment in the relationship. In this sense, Gemünden (1997) argues that as no company is ever able to define each detail, network management sometimes means actively managing and sometimes being managed. As in all business relationships, buyer-supplier relationships have effects on actors, resources and activities levels. Gadde and Håkansson (2001) state that supplier-strategic management requires a thorough analysis of suppliers' roles and the buying company's positioning on all these dimensions. The basic issue is to determine which activities the focal company must maintain and which ones it should entrust to other actors. This determines the type of control (proprietary or indirect) the company holds on activities and resources and how to use those resources. Any decision to produce or to purchase must take into account its impact on network identity and positioning rather than the more immediate effects of cost minimisation, which traditionally have driven the make-or-buy decision (Holmen and Pedersen, 2003).

It is not enough to consider only whether the functions that arise from the specialisation of activities and resources are complementary or not. Buying companies must try to

identify suppliers that, due to their characteristics and capabilities, may leverage their own resources and activities and cultivate their ability to deliver superior value to customers (Cousins and Spekman, 2000). Furthermore, the evaluation of supplier potential should include the analysis of the firm's relationships within other supply chains and the value that these connections may bring to the buying company.

In terms of activities, it is wise to consider the activity chain (pattern of sequential activities) and how it may be modified or improved to benefit the company's objectives, e.g. through the elimination or transfer of activities, the increase of coordination, and the chain replacement. In terms of resources, it is important to identify the critical resources, how they are distributed amongst the actors, how they can be accessed, and to consider the design of the adequate interfaces, because the value of resources is determined by the way they fit the contexts of both the producer (supplier) and user (buyer) (Araújo *et al.*, 1999). In short, given that supply chains influence companies' network positioning, buyers tend to act with the strategic purpose of reinforcing their network effectiveness and developing the basis for their future actions. In this sense, the selection, structuring and management of supplier relationships cannot be viewed as a means of attaining short-term results, but as a way to strengthen network positioning. This network perspective provides a way of understanding buyer-seller relationships, as well as the network in which they are embedded. However, despite the extensive and valuable research produced so far, important questions regarding supply management and its impact on the performance and strategy of the buying firm appear to have not been fully studied. The next section addresses some relevant issues in order to develop a comprehensive model that encompasses the three levels that authors usually consider relevant: dyads, portfolios and networks.

4. Towards a model of supply chain networks

In industrial markets, a company's positioning is broadly defined by "what" it makes and "with whom" it makes it. The "what" depends on its activities and resources and the "with whom" defines the set of actors, activities and resources it is able to mobilise. The questions "who are we?", "what do we make?", "who do we want to be?", and "what do we want to make?" are settled in networks and, in a more narrow angle, in focal nets. Nonetheless, these questions are connected: what the firm is and makes depends on its capability to mobilise other actors' resources and activities, which, in turn, depends on how valuable its own activities are to those other actors.

Loasby's (1998) concepts of direct and indirect capabilities, defined as knowing how to "make things" and how to "get things done by others", are likely to provide useful insights. Indirect capabilities are necessary to use the company's own capabilities effectively. Loasby (1998, p. 154) argues "that the knowledge required to make and sell any firm's products resides in the structure of direct and indirect capabilities within that firm, supplemented by the structure of indirect capabilities that connects it with other firms". To access other firms' capabilities, firms must make appropriate investments and develop their external and internal organisation.

Loasby's ideas are related to the work developed by Araújo *et al.* (1999) on interface management. It shows that internal control of resources and/or access of suppliers' resources is conditioned by buyer-supplier interfaces. These, in turn, have different effects on the parties (directly or indirectly) involved. Furthermore, rather than evaluating suppliers' current offers that express their static efficiency, buyers should evaluate suppliers' capabilities that shape their dynamic efficiency and condition their potential to add value to the client's business. Loasby (1998, p. 144) also addresses this issue, stating 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".

If these ideas are taken into consideration, then the question of "how to get things done by others" must also consider "what things to get done by others", *i.e.*, the types of suppliers' capabilities that the buying firm is looking for. Exploring suppliers' capabilities requires different investments in internal and external resources and activities. If capabilities are seen as conditions to perform specific functions or effects (as those presented earlier), it becomes clear that relationship functions and relationship types are closely associated. Defining and managing relationships with each supplier in order to benefit from a specific function or effect is a crucial "indirect capability" in a network setting.

However, the ability to "get things done by others" is strongly dependent on the buying firms' network position. As mentioned above, the mere existence of a potentially adequate supplier does not assure the possibility of (i) establishing a relationship or (ii) developing a relationship that best fits the buying company's interests. Moreover, since control is a result of both positioning and interaction, the possibility of indirectly controlling suppliers' resources depends on the buyer firm's power within the network, as Gadde and Håkansson (2001) show. In other words, it depends on the micro and macro positions of the buyer firm as well as on its capability to "get others to do the types of things it wants them to do".

Managing supplier relationships

Firms get different things from different suppliers - products, capabilities and intangible assets, such as knowledge and access to new networks. Suppliers' functions and effects derive from their resources and activities and the way each supplier relationship fits the focal company's own activities and resources. Moreover, these potential functions and effects may be enhanced or jeopardised by the buyer's capability to design the right relationship type for each supplier, to invest the adequate amount of resources to develop it, and to induce suppliers to behave in a way that best fits its own interests. Thus, the set of a firm's supplier relationships may present a high level of differentiation arising from several factors, namely the contribution of suppliers to fulfil the buying company's goals and strategies, the types of existing buyer-supplier relationships and the different positions (*e.g.* power/dependency) of both parties in those relationships. Effectively managing this diversity is a complex task. Firms have finite resources and they are usually encouraged to concentrate them on relationships with strategic suppliers. However, the question is: what makes a supplier strategic in nature? Some authors state that it is allowing the control of resources and activities that are critical to the focal company (Brito, 2001), or having specific capability profiles (Möller and Törrönen, 2000; Möller *et al.*, 2002). However, these definitions are not easy to operationalise. This difficulty arises from the potential effects and functions of relationships and the fact that suppliers' relevance is, at least partially, defined by the type of effects they expected to produce. Goldsmith and Bender (2004) aim at understanding the process by which a firm regards an offer as strategic on the basis of the notions of buyer's problem and calculus. Nonetheless, the underlying logic of searching for some functions and effects instead of others and of choosing some particular relationship type over others is still missing.

Managing supplier portfolios

The complexity of management is even greater if we consider the potential cross effects of suppliers' relationships at a portfolio level. Literature (*cf.* Araújo *et al.*, 1999; Ford and McDowell, 1999) prescribes that the buying company must evaluate the effects on the existing portfolio of a new relationship/supplier or a change in an existing relationship. Coordination and interaction processes amongst suppliers add another layer of complexity to supply management. Aside from the vertical bonds between the focal company and its suppliers, there are horizontal bonds between suppliers (Ritter and Gemünden, 2003). These may interact with each other due to and through the mediation of the

focal company. This means that the buying company will hardly be able to unilaterally decide and implement interaction mechanisms amongst its suppliers. The higher the number of actors involved, the harder it will be to manage those processes, due to their specific and potentially conflicting characteristics and interests.

Managing supplier networks

Managing supplier networks beyond direct suppliers deals with the invisibility of many indirect relationships and the intricate web of actors with competing and/or cooperating goals and interests. This level is directly related to the determination of suppliers’ network value and to the indirect functions they may perform. As mentioned above, network knowledge is essential to the development of “network theories” and to the network positioning and strategic action. As Holmen and Pedersen’s (2003) work shows, however, this knowledge is very limited, especially on the supply side of the company, where it seems almost non-existent. If this sort of blindness is voluntary or caused by lack of resources and capabilities or even by mere ignorance of network potential, it is an issue that deserves more attention.

These considerations show that moving from the dyadic level to the network level introduces a higher level of management complexity, and demands wider network knowledge. Such a complexity is amplified by the fact that firms’ interaction effects become more diffuse as

one considers larger units. At the same time, the focal company’s ability to mobilise other actors through its suppliers becomes more difficult as the distance between them increases and relationships become more and more opaque. In this context, the literature seems less able to explain “why” and “how” interaction takes place between the focal company and its suppliers.

Figure 1 illustrates how these levels are associated with a number of the research issues that will be incorporated in our final model. Departing from the dyadic level, the scope of analysis has been progressively enlarged until reaching the network level. Each level leaves room for further research in order to explore issues that seem to be driven by the application of a network perspective to supply management.

Firstly, at the lower level, relationship types have been researched in depth, but an understanding of the logic behind relationship choice and management deserves special attention. In this context, it is important to explore (i) the links between relationship type and relationship functions and effects; (ii) the impact of firms’ micro-positions on relationship choice and management; and (iii) how the focal company mobilises its partners in those different cases.

Secondly, at the portfolio level, another important field of investigation concerns the establishment and development of interaction amongst different suppliers, the coordination and adaptation mechanisms, and the roles participants play in such a process. Research should focus on (i) the

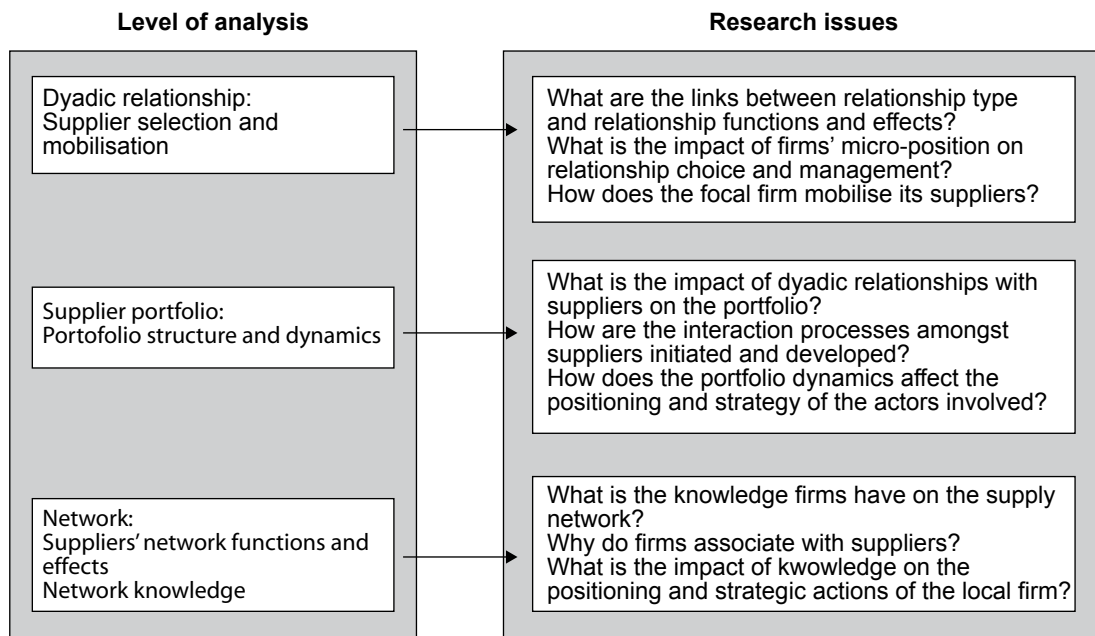


Figure 1. Levels of research issues.

type of effects dyadic relationships with suppliers have on the portfolio; (ii) how the interaction processes amongst suppliers are initiated and developed; and (iii) how the portfolio dynamics affect both the positioning and strategy of the actors involved.

The last level refers to the network. In this case, the "network" corresponds to the concept of "network context" suggested by Anderson *et al.* (1994) and Holmen and Pedersen (2003), as well as to the concept of "focal net" referred to by Möller and Halinen (1999) – *i.e.* the limits of the network are set according to the focal company's perception about the relevance of other actors. In this context, it seems important to study (i) the knowledge companies have on supply networks – *i.e.* how far it goes, and how valuable it is considered to be; (ii) the reasons for associating with suppliers and the type of interaction adopted; and (iii) the impact of knowledge about and interaction with indirect counterparts on the positioning and strategic actions of the focal company, namely through its network theories.

The three-level model depicted in Figure 2 integrates the links between these research issues and their respective levels of analysis into a conceptual framework that offers a comprehensive vision of their underlying logic.

Figure 2 encompasses a number of issues that deserve an explanation. Firstly, strategy, network theories and positioning (1) are interrelated concepts that condition and are conditioned by the dyadic relationships (2) the

company establishes with its suppliers. Secondly, supplier portfolio (3) may influence the focal company and the net of suppliers at two levels. On the one hand, each dyadic relationship may endure the impact of other relationships with suppliers through the mediation of the buying company and, simultaneously, these changes may also condition its positioning and strategy in each of the dyads and its capability to act according to its objectives and expectations. On the other hand, suppliers may establish or develop horizontal relationships amongst themselves outside the influence of the buying company. These interactions may have profound effects on both the focal company and their suppliers.

Thirdly, besides the interaction with its direct suppliers, the focal company is also influenced by the suppliers' suppliers (4), which can work either in its favour or against it. The relationships between suppliers and their respective suppliers enhance their network functions and effects. The possibilities for the focal company to take advantage of them depend to a great extent on its network knowledge, its macro and micro positioning and also on its direct suppliers' macro and micro positions, *i.e.* on their ability to mobilise their own focal relationship actors. Finally, regardless of the existence of direct or indirect interaction between the buying company and its suppliers' suppliers, they are likely to influence the focal company's network theories, and consequently its strategy and positioning (5).

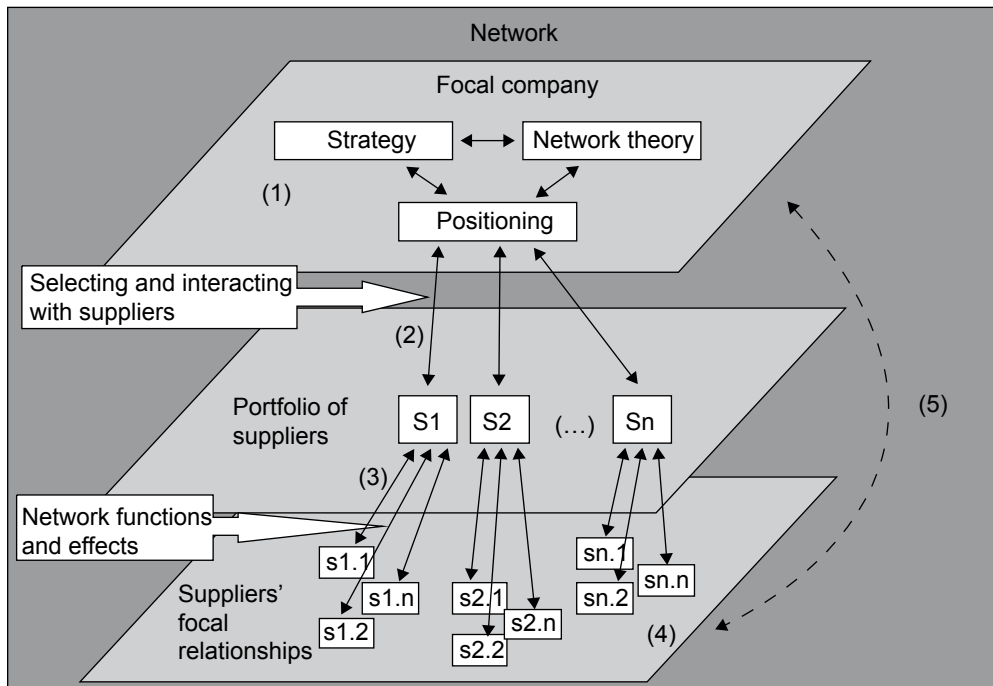


Figure 2. The three-level model.

5. Conclusion

Supplier management has received ever greater attention due to its impact on companies' performance. At the same time, new forms of interorganisational relationships have emerged, creating the need to review the theories and models that have oriented earlier thinking. The network approach developed by the IMP group is likely to provide a coherent conceptual basis for the understanding of the complexity of this intricate web of relationships, interests and behaviours.

The model proposed in this article aims to offer a coherent basis for dealing with some specific issues associated with managing supply chains in industrial networks. The literature review highlighted that dyadic relationships with suppliers have been studied intensely over the past few years. However, managing such relationships in the context of more complex levels of supplier portfolios and supplier networks presents a number of issues that deserve more attention. The model attempts to deal with these issues by incorporating how supplier's functions and effects influence the buying company.

The key managerial implication is that buying firms should not restrict their efforts to managing relationships with suppliers. Rather, due to the relationships' indirect effects and functions, they must extend their focus to supplier portfolios and networks. At the portfolio level they have to anticipate and manage the cross effects of changes in individual relationships. This means that the coordination of suppliers may result in enhanced performance for the buyer company as well as for its suppliers. At the network level, a better understanding of suppliers' own connections and their impact on the buying company is a precondition for managing or at least monitoring those indirect effects. To sum up, the literature on supply management is split into three major streams of research. Dyadic supplier relationships, portfolio models and supply networks have been the objects of much attention. Nevertheless, they do not offer an integrated view. The strength of our model, we believe, resides in its effort to integrate these three streams of research by providing a coherent conceptual basis for the understanding of the complexity of this intricate web of relationships. More than a finished product, we hope that the model constitutes a tool that contributes to more effective supply management without losing the more integrated and wider view of the network approach.

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