

Market Driven Management and Global Supply Chain*

*Monica Faraoni** , Lorenzo Petretto****

1. Global Markets and Supply Chain

The market globalization and the conditions of over-supply, together with demand uncertainty and instability, have pushed companies to face new competitive challenges and major changes in the way business are managed. For example, companies now operate and compete in global markets (Brondoni, 2008), supply chains articulate with an increasing degree of interdependence among the different production realities (Pepe, 2007) and the degree of interaction between the firm and its various stakeholders, with whom it creates a network of relationships, is always higher (Arrigo, 2009). Also, the possession of both managerial and social skills, the competitive structure of alliances, and the time-based management become essential vehicles for achieving competitive advantages and maintaining superior positions against competitors (Vallini and Simoni, 2009).

In such a competitive space, the development factors of enterprises themselves obviously change; firms can no longer rely exclusively on the ownership of specific resources, knowledge and skills, rather they need to rely on new competitive behaviours, on the development of interchanges with all those belonging to the sector, on the dissemination of an appropriate corporate culture and on the search for consensus and legitimacy (competitive, social and institutional) within its market place. In addition to this, today, while the barriers to global movements have been removed, the sources of global competition have increased. Alongside technological advancement and production efficiency allow most companies to produce more and at lower costs. The result is an over-supply in almost every industry, resulting in a competitive pressure stronger than ever. In the outlined context, a new approach in managing the supply chains and the consequent optimization of material flows and intangible assets plays a crucial

* The Authors: M. Faraoni §§ 3, 4; L. Petretto §§ 1, 2

** Assistant Professor of Management, University of Florence

*** PhD in Firms and Local Systems Management, University of Florence

role for improving long-term performances of both individuals belonging to the chain and the entire supply chain. Since long, companies have been increasingly seeing themselves as a part of a supply chain that competes with other chains rather than as individual firms competing with each other (Christopher 1998). Integration within the single company is no longer sufficient. Companies are part of a systematic network of companies with interrelated nodes to other companies, and where the involvement of all the upstream and downstream players in those processes and activities that produce value, is vital.

An efficient management of the network allows not only to contain costs but also to reduce the time-to-market for launching new products, to increase the ability to collaborate with value-chain partners and, more important, the ability to generate greater value for the customers. This value is achieved if the quality of relations between operators in the industry in terms of continuous collaboration, transparency and mutual trust, allows the pursuit of an optimization of the overall supply chain. This is made possible due to:

- A coordinated fulfillment of the various players who are part of the chain;
- The adoption of available new management techniques and new tools and technical information (first result of globalization processes);
- The adoption of a logical system in the implementation of integrated strategic actions such as: the choice of assets, management and development of suppliers, operational and sales planning and strategic inventory planning.

These factors enable firms to operate in environments characterized by the globalization of both supply and target markets, as well as distribution channels (Brondoni, 2008).

These requirements are also crucial as we approach the designing and management of global supply chains, that by operating without any geographic boundaries, show a high degree of complexity in managing relations among the companies involved in the exchange of product flows, services and information (Mentzer, 2001) often belonging to and/or operating in very different markets. Traditional models of planning and management of supply networks have as their purpose the achievement of effectiveness and efficiency performances, that find in the stable operating conditions the element that makes possible the continuous improvement of performance. They are, therefore, models that are unable to provide adequate performances in environments with high variability, due to their low ability to adapt quickly to changes, let alone anticipate them. Therefore, when we face global markets, it also follows a shift in the understanding of the provision that the supply chain has to offer as a function of the different directions of the company. A marketing-oriented company for example, focuses its attention on the customers through product differentiation and tries to cope with different tastes and preferences of customers and exploit market opportunities. In these cases it is involved mainly its role and strategic marketing for which the supply chain is configured to provide flexibility to reduce costs for differentiation and rapid response.

The situation is different for market-driven firms. They involve in their competitive approach all the stakeholders and players in the industry (Hills and

Sarin, 2003). The configuration of the supply chain becomes complex and able to respond not only to the imperatives of optimization and efficiency but also to easily reorganize itself in order to react swiftly to changes in supply, and reshape existing markets or create new ones, or to introduce discontinuities in how to create value (Kumar, Scheer and Kotler, 2002). Moreover, in the knowledge that the competitiveness does not depend solely on quality of products and services, but also and especially on how the company works and how it is able to define operational models for change, high predictive power and monitoring of markets will be required, together with a significant propensity to adopt new technologies shared across the network, and organizational skills of network designing and/or re-designing (Narver, Slater and MacLachlan, 2004).

The new global supply chain approach adopted by market-driven firms is based, therefore, on the combination of three elements:

1. Ability to understand the market and speed to satisfy it (the winners of the industry will be those who have the skill to reach customers by understanding their needs and the changing nature of their needs);
2. Agility and adaptability to external circumstances while maintaining optimal cost and service structure;
3. Reliability, obtained by minimizing waste and reducing time in all phases.

The purpose of this work is precisely to identify the new designing drivers for the configuration of supply chains for market-driven firms operating in the global context. The configuration that in our view appears to be adequate to the above-mentioned needs assumes the characteristics of a type of demand driven supply network or of a supply network whose dynamics are in perfect sync with the market demand and which are able to easily reconfigure themselves to exploit opportunities generated by the instability and the temporary nature of demand.

2. Supply Chains in Global Companies: the Global Sourcing

The birth and development of global markets had important consequences on competitive and business growth strategies. Indeed, the global organization of procurement activities, processing and/or production, marketing and distribution of goods requires the adoption of strategic moves with a high degree of interdependence across countries and more than ever based on the exploitation of competitive advantages at a supranational level. Hence, the need to create a worldwide organizational structure in which the entire production chain is articulated on a global scale. With regard to sourcing strategies, market globalization on the one hand forced companies to use a much longer supply chain, which includes all the possible suppliers around the world, and on the other gave to firms the opportunity to choose their suppliers globally. Furthermore, while in the past companies chose to source internationally for cost savings or for the lack of the products they needed at a local level, nowadays companies obtain their supplies around the world to try to create a competitive advantage due to the higher quality and new technologies offered by a global supply.

In regard to this, it is important to distinguish between international and global supply. The international supply is related to companies that indirectly rely on foreign supplies (through brokers) or directly by necessity, as in the case where materials or components are not available locally, or when the available materials from local suppliers are inadequate to meet consumers demand. The global sourcing instead is characterized by the existence of a complete integration of organizational systems and information, in order to maximize the added value on goods and get the advantages given by the production and designing ability of the best available suppliers around the world (Monczka and Trent 1991a, 1991b).

In this new management model a different commitment is sought to all players belonging to the supply chains both in the types of services offered, that must be more and more qualified, and in the ability to assume increasingly wide risk and investment shares. The competitive focus shifts from the simple supply relationship to the partnership and copartnership among all the stakeholders in the chain. Only by establishing and maintaining partnerships between customer and supplier, in fact, the firm is able to meet most effectively the demand and achieve those goals of quality and low costs of supplies related to the continuous reduction of costs, streamline processes and the elimination of waste. Added to this is also an optimization of time and thereby a reduction of the lead time for production and delivery, elements increasingly needed to cope with a market characterized by over-supply and high variability in demand.

Direct consequence the above-said statement is that the global sourcing is rapidly becoming a prerequisite for market-driven firms that operate in current markets. This is a new strategic orientation of the firm, under which the supplies become opportunities to purchase in a heterogeneous environment and an efficient way to implement strategies about focusing or differentiating, that are the main sources of those previously mentioned competitive advantages (Keegan 1983, Monczka and Trent, 1991).

Today, global delivery strategies represent a proactive strategy (Tamer, Yaprak and Yeoh, 1993) through which companies can improve their skills and their processes by increasing the quality of components, materials and semi-finished products exchanged, optimizing shipping and reducing the lead time for delivery. The other benefits that encourage companies to supply globally can be: the availability of raw materials, short product development times, the improvement of corporate image, the achievement of better delivery conditions and lastly, the improvement of competitiveness at an international level.

As to make the global supply strategies work efficiently, they must be carefully designed, assessed, integrated with other business functions, and they must receive the full support of management. They therefore require substantial, financial, and managerial resources that are also reflected in the choice regarding the configuration of supply, namely the choice between a centralized or decentralized approach. Finally, to become effective, the strategy of global sourcing requires integration into the formal undertaking. The system of global supply must be coordinated both vertically with the overall corporate policy and horizontally with all business functions (in particular, purchasing and production), thus establishing a global network able to transform the supply strategy from a simple execution of supply tasks to a series of coordinated activities for managing

the entire supply chain. Thus, it will be needed to redesign the value chain to meet the diverse demands of its customers, by separating the various business activities, each with its own suppliers. The company must then connect all these activities to generate a new business model that abandons the simple form of incoming supplies to get to an integrated management structure of production networks.

The creation of such global networks of production and supply permits to obtain collaborative benefits that allow each partner to obtain a shared competitive advantage. Indeed, without a collaboration between business partners, the benefit would be limited to cost reduction, which does not happen in the case of cooperation of all partners, where the possibility of obtaining better performance time and quality is easier.

Against this, however, some problems of implementation must be mentioned (linked, for example to cultural differences and to duties imposed by governments) that can clearly affect, and not only complicate, the conduct of a global supply. Supplying in foreign countries for the enterprise also involves careful consideration of political and economic risks related to each country that may have different effects depending on the experience of managers on global supply, that allows to manage new challenges more promptly and then with better results. Another problem that arises in implementing a global supply company strategy is the company size. However, even if these strategies are at best preserved for large enterprises, opportunities for SMEs to source globally due to forms of strategic alliances such as joint ventures should not be excluded.

As the global sourcing is rapidly entering the business strategies of companies, the cost of logistics involved in global supply chain appears to be increasingly crucial. The costs of global sourcing not only affect the growth of inventory financing, transportation and administration, but may include loss of product quality, increased difficulty in contact with several suppliers and increasing lead times. Thus, if the company implements a flexible manufacturing system (lean production), it is forced to tolerate higher costs when supplying globally, because operating in a just-in-time production system and maintaining close contacts with far factories and suppliers appears to be very complex. Moreover, the adoption of a strategy of global sourcing can generate costs when the delivery lead time is lengthened. These costs take the form of increased expenditures relating to the dispersion of the value chain, namely the relationship between the supply business and other activities, also called 'relational factors' (Bartlett and Ghoshal 1990). The flows of goods and information across the supply chain are often subject to disruption because of the distance between the phases of the chain and of the integration modalities among them. For example, the distance not only increases the shipment time, but can also cause long delays due to unforeseen weather conditions or strikes, linguistic and cultural differences, and so on. In this complex system, an interruption of even one element of the chain can lead to changes and adjustments in all other parts of the system. If the distances are short, and so are the lead times, and at the same time the communication is good, the supply chain can react quickly. Conversely, if the elements of the chain are separated by large distances and the lead time and communication are not

optimal, then the supply chain will be less reactive, thus generating additional costs in terms of accelerated shipments, unmet demand and inventory expenses.

With the adoption of global sourcing strategies, therefore, the process of business sharing catches the attention. The production and processing, movement of materials and products, the administrative procedures and bureaucracy, flow into one integrated stream of information, partly physical and partly virtual, covering the entire lifecycle of the product, from its conception to its final destination. However, as also previously mentioned, the global markets are not homogeneous and, for many product categories, they still require local variations. For the firm it is needed to understand how to deliver to local markets the variety they are seeking, while taking advantage of the benefits of standardized global production and understand how to manage the links in the global chain, from the supplying sources to the final user.

The need to better manage all these variables leads to the search for suitable designing drivers to follow and to be taken into account in designing and implementing the model of global sourcing.

3. The Drivers of the Global Supply Chain Design

It is since the 70's that there have been important contributions from academics and managers on the analysis of how to best design and manage supply networks.

The Supply Chain Management (also SCM) becomes a true discipline of study, however, from the mid 80's and the interest for it gradually increased as companies have begun to reap the benefits of cooperative relationships (Gattorna, 1998). The SCM is certainly an effective means for acquiring a competitive advantage internationally (Evans et al., 1996), so that it has been defined as the 'integration of business processes by final users to original suppliers that provides products, services and information and adds value to the consumer' (Lambert et. al., 1998). It is clear, in fact, that in cases where the company is focused on individual goals rather than objectives and activities integrated with other firms of the network, there will be situations of sub-optimization and loss of efficiency (Cooper et al. 1997; Stevens 1989).

The need for an integrated supply comes mainly from the need to respond efficiently and effectively to uncertainty and variability of the market demand. Uncertainty is a key dimension of the analysis that explains the efforts to find appropriate designing drivers to identify network configurations that create conditions of greater stability. Typically, the effects of uncertainty (in the supply and demand processes) were considered to have greater impact on the production function (Wilding, 1998), but since 1993 some authors (Davis, 1993) began to hypothesize that the main problem of designing , managing , and controlling complex supply networks was due to the fact that even within the network it was difficult to find stable operating conditions to the point to often create inefficiencies and loss of value of the activities carried out. The lack of adequate answers to questions like: which product will order my client? How many products do I need in stock?, How long must I deliver and in what condition? create the foundations of the state of uncertainty. This has led companies to

design systems with appropriate buffer for meeting times, capacity-logistics, inventories in order to prevent the possibility of poor network performances in relation to customer expectations. These buffers, however, reduce the operating performance and the ability to achieve competitive advantage.

The uncertainties of the network can be grouped into three categories (Van der Vorst, 2000):

1. High variability in demand or supply that creates problems in network planning, programming, and controlling (Fischer et. al., 1997);
2. Non-optimal configuration of the current network that reduces the performance as in the case of a rigid structure or capacity of the information system with delays, and so on;
3. Exogenous factors as changes in markets, products, technologies, competitors or government regulations.

In all these cases the task of management is to redesign the network to better align the objectives to be pursued and reduce variability. There are many studies in this regard that focus attention on key strategies for reconfiguration. In the overall analysis of such works it is shown how the attention has focused on several design drivers such as identifying a kind of path. In fact if we look at the direction through which the SCM appears to have driven the process of planning and coordinating we can distinguish different periods. Firstly the focus has been the acquisition of competitive advantage through cost reduction targets and acquisition of greater efficiency of the networks. The assumption underlying this objective is that the cost efficiencies enables the reduction in price which increases the level of customer satisfaction. This approach consequence is the creation of a network management model that emphasizes short-term vision and nourishes the risk of missing opportunities to achieve broader objectives. Secondly, the driver of efficiency leads to a loss of focus on the consumer or final user. It assumes the existence of a 'static' condition of the market, and not the variability of consumer expectations. Subsequently, attention has focused on the dynamics of network control and on logistics. Interesting are the studies that have concerned the review of roles and sharing processes among those involved (Stern et. al., 1996, Thomas and Griffin, 1996), or control structure of the network by reducing the lead time (Beamon and Ware, 1998), or synchronization of logistics processes demand (Persson, 1995), as well as simplifying the logistical coordination and decisions. Recently, attention has been placed on information systems to support the network in order to create transparent flows of movement in real-time information. Finally, the last comments concern the sharing of objectives between the partners of the network and a greater involvement in the processes.

All these approaches are aimed to detect the best network performance increasingly viewed as a model organization of supply that companies offer in the market. The problem of increased demand management, assumed by hypothesis as a variable hardly predictable, has never been faced. In this regard, an important contribution which introduces new designing driver is that of Fisher (1997). The author believes that the functions of a supply chain depend on the nature of the application. In his model he distinguishes between functional products and

innovative products. On the one side the first call for efficient supply chain in which the costs of production, transport and storage should be minimized. The designing driver are therefore represented by high availability, fast supply and cost efficiency. On the other side instead, as for innovative products he talks of a responsive supply chain for which the driver of the lead-time is predominant and can answer 'accurately' or meet the expectations of customers. Resulting performance measurement methods differ materially. In 'efficient' supply chains the coefficients of the network, the system costs and the rate of turnover are emphasized, while in the responsive supply chain attention is paid to the cost of lost sales or excess storage. In conclusion, the author suggests that the performance depends on the ability to design networks that have the adequate benefits to those required by the characteristics of the demanded products. This model is further developed by Hau Lee (2002) that deepens and extends Fisher's considerations also to uncertainty over the supply and demand. A distinction is made between stable supply process, when the production structure and technologies are in the maturity, and evolving supply chain, when instead both the productive apparatus of reference and the underlying technologies are not well defined yet. In stable conditions of the supply if the uncertainty of demand is low, the main designing driver is the efficiency of the network and if the uncertainty of demand is high, the driver becomes the coverage of risk; then in a position of evolving supply the designing driver becomes the rate of reaction if the uncertainty of demand is low, and the agility if the uncertainty is high.

Recently, interesting contributions are still pushing the debate forward by introducing the concept of Demand Chain Management (Rainbird 2004, Walters, Rainbird, 2004) to highlight the fact that the designing driver chain must be the sales market and demand, and not the supply market. Langabeer and Rose (2001) define demand chain management as 'the complex web of business processes and activities that help firms understand, manage, and create ultimate consumer demand.' In practice, this approach starts from the consideration that even in finding the best configuration of the supply network, attention is focused on market conditions and demand characteristics rather than on the production constraints of supply chains and logistics-supply structure. With this contribution we begin, in our view, to envisage the transition from a 'push' logic of network construction, to a 'pull' logic.

Finally, a last point of reflection comes from the proposal of some authors on the replacement of the word 'chain' with 'network' to report that it should be included in the system, and therefore the subject of planning and coordination, also those situations of 'multiple suppliers'. In practice in designing new configurations we must also consider the conditions of competition between suppliers. Also belonging to this line of thought is the debate on the more or less open network links in the process of choosing the most appropriate configuration. Many argue that in fact the most open network (and therefore characterized by weak reports), providing access to different sources of information and knowledge, can be an important stimulus to the heterogeneity of the company and the promotion of change and innovation (Burt 2004; McEvily and Zaheer 1999; Rodan and Galunic 2004), minimizing at the same time the risk due to excessive development of close and more binding ties (Obstfeld, 2005).

This concept is pushed to the extreme in what is called the crowdsourcing (Lamoreaux, 2006), which is nothing but a spontaneous network that is established between experts and practitioners with specialist knowledge in specific areas of scientific and technical, which is used by companies to supply high skills at low costs. In this case there is no predetermined structure of supply chains but this is articulated from time to time according to the players who can engage to solve a particular problem. Changing the supply needs of the company, the network itself reconfigures with new and different players. The success of this model depends essentially on two components:

1. The strength of weak ties, i.e. the most efficient networks are sometimes those that arise spontaneously in an instigation of the company but without complex engineering and who can link the wider genre of sources of information, knowledge and experience;
2. The diffusion of technological innovations that are eroding the industry boundaries about the general applicability of the methods and solutions to similar problems across different technological and scientific domains.

To conclude this overview of the new guidelines important elements are emerging, that pave the way for a discussion on developing a network of adequate supply to companies market-driven. And it is obviously clear that the performance and competitiveness of such enterprises in the global market cannot be pursued by re-designing the supply network to adapt to new targets or to eliminate inefficiency, but it is needed to cope with the extreme dynamism and impermanence of demand sometimes expressed by bubbles that are highly volatile. Hence it is needed to think of a responsive supply chain to pull and not push logic, as it was in the past.

In practice, while in models built on assumptions of stability of the application based on the traditional product life cycle the variability of the supply chain is the main cause of erosion of profit margins, in market-driven companies the variability of the supply chain must become instead a source of profit and acquisition of competitive advantage.

4. A New Model of Supply Chain for Market-Driven Companies: the Demand-Driven Supply Network

The model that we are going to present is inspired by two different theoretical approaches. On the one hand, we refer to recent contributions from the Supply Chain Management in reference to that line of studies that looks at supply chains as determinants of competitive advantages of companies and wonders about the ways in which a chain must migrate from a template 'lean and functional' to a model 'agile and customized' to be able to acquire the company a market advantage (Christopher, Towill, 2000). Part of this discussion then focuses on identifying the time of incorporation of the two logics by defining the decoupling point (or doubling point) compared to the flows of materials that represents the 'when' the supply chain is changed from 'push' to 'pull' logics (Olhager, 2003; Brabazon, MacCarthy, 2006; Hoekstra and Romme, 1992). Same topic is dealt

with in the choice set of ‘postponement’ and ‘speculation’ also addressed to the determination of when to switch from push to pull logics (Mentzer, 2008;).

On the other hand A second contribution comes from the literature on market-driven management in two aspects: on one hand the needed integration of push and pull business processes have long been supported¹, on the other it is argued that a firm operating in market-driven contexts has a natural predisposition to use a flexible relationship with third parties. Indeed the web development organizations (networking) that can comply in a changing way, with stable or very dynamic and variable relationships (Brondoni, 2007) is analyzed as a possible solution to cope with the temporary nature of the application. In our model this assumption is at the base of the hypothesis according to which we state that the speed with which firms reconfigure their network is synonymous of a greater competitiveness in the market.

Designing a supply chain to market-driven companies operating in global markets means first:

1. Giving the company an adequate system of forecasting and monitoring of the application;
2. Building an information network that can quickly disseminate information on the application to allow rapid adjustment of the supply chain or network to change;
3. Quickly reconfiguring and redesigning the network to capitalize on the immediate, and perhaps only temporarily, the nascent market opportunities;
4. Continually reviewing the various drivers that guide the design choices.

□ *Michael Aguilar, senior vice-president of Strategic Supply Chain Initiative of Panasonic, saw the opportunity to reinvent the company, largely through a redesign of the supply chain. Everything started from the conviction that the Panasonic could not be focused on selling products to dealers because by doing so there was no perception of what consumers really wanted. Aguilar argued that the sale cannot be predicted because it becomes true only after the consumer has purchased. They then edited all the processes to be able to operate not as a traditional society of goods consumers, but as if it were actually a Panasonic dealer. Panasonic has thus transformed the supply chain from the back office to front office making it the main source of profitability for the effects on sales (500% against an overall market increase of 200% in 2005). The key point of the whole process was the direct management through a custom software and surveys of forecasts of supply for retailers who allowed a number of advantages:*

1. *Elimination of inventories of major retailers and adequacy of its investigation to the final customer demand;*
2. *Elimination of the retailers’ out-of-stocks;*
3. *Reduction in average inventory weeks;*
4. *Revenues increase.*

The main goal of management of market-driven company is to understand the trends in demand or possibly anticipate and be able to satisfy it with appropriate products/services. It is demand, then, that defines the objectives of the supply chain, while the supply chain must have the capacity to cope, to shape, and sustain demand itself. Some authors speak of the relationship between characteristics of demand and supply process as a 'catalytic effect' (Rainbird, 2004). The goal of a correct configuration of business processes becomes thus to ensure a close and precise alignment between demand and supply network in order to reduce however temporal and geographical constraints. It follows that the concept underlying the model of the Demand Driven Supply Network (DDSN) we want to build is the convergence and particularly the management of marketing synchronized with the network structure of supply.

The DDSN can be defined as a system of coordinated technologies and processes that requires and responds to signals in real time applications received through the network of customers, suppliers and employees. Enabling the company to improve operational efficiency, develop and launch new products and maximize margins.

The application of the DDSN model involves the transformation of supply chain models based on prediction of demand (or supply-driven push logic) in models based on survey of demand (pull or demand driven logic).

Operating on the demand prediction allows to properly organize materials and production process and logistics to ensure adequate management of deliveries to any distribution center and/or stock. Even if those predictions allow to acquire the right materials and make the right products, they are focused on product availability at the distribution center. Meanwhile, the consumer may have lost interest in that product or the demand could be shifted. If to this situation we add the product or technological innovation, or other changes, the resulting process is far from being dynamic and responsive. Transforming a process based on predictions in a model based on survey results, however, implies the ability to create credible and effective perception of signals of demand that can be shared among the partners in the chain, preferably in real time. These signals generate information flows from the market that, properly distributed through the network, can reconfigure the network itself within the appropriate time.

Critical tasks of this model are:

1. *Acquiring the ability to network design or re-design* in order to replace the 'chain' or logistics-production chain with a logistics-production 'network' whose players are alternately activated according to the features of the emerging detected demand;
2. *Reducing the throughput time of the network (TAR)*. Once you know the new features of the demand, logistics-production time of crossing network or the time required for processing raw materials into finished products and logistics time for moving semi-assembled or manufactured materials among the players in the network, must be reduced in order to have a value lower than the time of waiting for the market (TAM), i.e. the time that the market is willing to wait once the demand has been expressed.

From the intersection of these two dimensions 4 different models of supply network configuration are obtained, as shown by the matrix below:

Figure 1: Pull/Push Supply Chain (or Network) Configuration Model

| | | |
|--|---|--|
| <p style="text-align: center;">TAM > TAR</p> <p style="text-align: center;">Relationship between Market Awaiting Time (TAM) / Throughput Time of the Network (TAR)</p> <p style="text-align: center;">TAM < TAR</p> | <p style="text-align: center;">Demand Driven Supply Chain</p> <p style="text-align: center;">Traditional Model</p> | <p style="text-align: center;">Demand Driven Supply Network</p> <p style="text-align: center;">Pull Model</p> |
| | <p style="text-align: center;">Traditional Supply Chain</p> <p style="text-align: center;">Push Model</p> | <p style="text-align: center;">Integrated Supply Network</p> <p style="text-align: center;">Push-Pull Model</p> |
| | Low | High |
| | Speed of Network Design (or Redesign) | |

From the crossing of the dimensions two models of supply chain are resulting (traditional and demand driven), as well as two models of supply network (integrated and demand driven).

Models of Supply Chain

- a. **Traditional (Push).** This is a push model based on anticipated demand because the waiting time does not allow the market to operate on a pull logics being shorter than the logistics-productive throughput time of the chain. Moreover, the lack of an ability to reconfigure the network makes it difficult to quickly and effectively replace the players to whom companies tend to have established and structured relationships. In these models, the designing driver is the proper chain integration, the only element that can provide competitive advantage and value creation
- b. **Demand-Driven (Pull).** In these cases the waiting time of the market is longer than the time of production logistics so it is possible to work with pull logics and the process starts after the detection of market demand. The reason why the time is shorter may be linked to the characteristics of production technology and/or efficiency, but also tightly integrated logistics and supply chain speed that allows to quickly respond to the demand. Even if this brings the benefit of the pull model, it also has the limitation of relying on highly structured and inflexible chains that reduce the opportunities for value creation and innovation of product and market. Driver design is in this case the quality and competence of the players in the chain

Models of Supply Network

- a. ***Integrated (Push-Pull)***. It is defined ‘integrated’ because it is built with logics to predict the demand for the detection and monitoring. Since the waiting time in the market is shorter than the time needed to carry out productive and logistic activities, the model predicts that the first stages of work are anticipated in relation to the manifestation of the demand and the definition of predictable data. Once detected the actual characteristics of the demand, the high-speed of the network design leads to the reconfiguration of the network according to changing requirements. This is a model that seeks to recover efficiency and create more value in the final stages having the need to use anyway predictable data. The designing driver in this case is the speed of the network. The faster it is, the lower is the number of stages operated on predictions rather than on detection of the demand.
- b. ***Demand-Driven (Pull)***. The model allows to reconfigure the network only after detecting the characteristics of the application. This allows the designing of a sector not only able to put together a product and / or service that meets the characteristics determined by the demand, but also to propose innovative solutions that can influence, guide, and modify the application itself. The ingredients of this model include the existence of an increasingly efficient and rapid chain that operates with logistics-production times lower than market expectations but also flexible and able to involve different players through appropriate network design ability. This way, the function of creating value and enabling the basic conditions to seize the opportunities of the temporary and unstable application of global markets, can be maximized. The designing driver in this case cannot be identified *a priori*, but varies from time to time depending on the characteristics of the demand. This is in practice the model that is able to ensure flexibility, speed of response, and market driven innovation in companies.

The Requirements of the Demand-Driven Supply Network

The model above-outlined requires some basic requirements, such as

1. ***Use of appropriate simulation tools and network design or re-design***. To test for possible different answers to each contingent event. It is sufficient to just change some parameters to arrive at different conclusions. They allow reconfiguration and real-time supply networks in correspondence with changes in market conditions. They are applications that graph the supply chain by defining the nodes of the network (production sites, distribution centers owned or third parties, production or distribution of providers), the peculiar characteristics of each node (type of product produced or stored, production capacity or storage, and so on) and the

relationships among them (such as re-order quantities, lead times, distances). Through these applications it is possible to outline a model and parameterization of the supply chain and simulations to assess the effects of a pattern of physical flows can be carried out (e.g., substitution of one supplier with another located at greater distance but with a more reliable delivery). The evaluation is done through a detailed reporting system that allows to continuously monitor key performance logistics indicators.

2. *Adoption and diffusion of appropriate technologies and information systems within the network.* In order to make the model is applicable, it is undeniable that the information flow coming from the market must be detected and quickly spread to all players in the supply chain. This is possible today thanks to some new technologies in logistics and distribution systems such as RFID and UPC/EAN for products coding, that detect the real-time movement of products in the chain and in the final market. There also are new technologies for Product Data Management (PDM) that allow the sharing of product information in the network. In particular, it is possible to define structured pathways of communication that, according to a predefined design flow of the process governing the exchange of information and documents between individuals or teams that are geographically far apart, however, integrate. Finally more and more essential are the new models of e-procurement to help companies manage in real time all stages of global sourcing.
3. *Demand-Driven lean manufacturing.* The production model capable of maximizing the expected results provides shorter lines based on small batches of product easily modified to cope with changes in effective demand. Operational planning cycles should be reduced to ensure greater flexibility of response times. Instead of planning the next three to four weeks of production cycle on the basis of the prediction, a manufacturing approach that protects the agility can only operate with production cycles of one week or maybe even less. The production theory has always sustained that a long production program could lead to greater profitability for the economies achieved in conditions of stability. Today we can say that this is not always true because theoretically less efficient production programs can achieve a better ROI with the DDSN model for the ability to modify products more quickly towards more profitable ones, because demanded by the market.

Bibliography

- Arrigo Elisa, Market Driven Management, Global Competition and Corporate Responsibility, *Symphonya. Emerging Issues in Management (www.unimib.it/symphonya)*, n.1, 2009.
- Bartlett Christopher, Ghoshal Sumatra, Management globale: la soluzione transnazionale per la direzione d'impresa, ETAS libri, 1990.

- Beamon Benita M., Ware Tonja M., A Process Quality Model for the Analysis, Improvement and Control of Supply Chain Systems, *International Journal of Physical Distribution & Logistics Management*, Vol. 28, n.9, 1998, pp.704-15.
- Brabazon Philip G., MacCarthy Bart, Order Fulfilment Models from the Catalog Mode of Mass Customization - a Review, Blecker T., Friedrich G. (eds.), *Mass Customization: Challenges and Solutions*, Springer, New York, 2006, pp. 211-231.
- Brondoni Silvio M., Ouverture de 'Market-Driven Management and Global Markets', *Symphonya. Emerging Issues in Management (www.unimib.it/symphonya)*, n. 2, 2008.
- Brondoni Silvio M., Market driven management ed economia d'impresa globale, S.M. Brondoni (ed.), *Market-Driven Management, concorrenza e mercati globali*, Giappichelli, Torino, 2007, pp.19-63.
- Burt Ronald S., Structural Holes and Good Ideas, *American Journal of Sociology*, 110(2), 2004, pp. 349-399.
- Christopher Martin, *Logistics and Supply Chain Management: Strategies for Reducing Costs and Improving Services*, Pitman Publishing, London, 1998.
- Christopher Martin, Towill Denis R., Supply Chain Migration from Lean and Functional to Agile and Customized, *Supply Chain Management: an International Journal*, vol. 5, n. 4, 2000, pp. 206-213.
- Cooper Martha C., Lambert Douglas M., Pagh Janus D., Supply Chain Management: More than a New Name for Logistics, *International Journal of Logistics Management*, Vol. 8 No.1, 1997, pp.1-13.
- Corniani Margherita, Market-driven management e politiche d'impresa push-pull, *Symphonya. Emerging Issues in Management (www.unimib.it/symphonya)*, n.1, 2008.
- Davis Tom, Effective Supply Chain Management, *Sloan Management Review*, 1993, pp.35-46.
- Evans Gary N., Naim Mohamed M., Towill Denis R., Educating the Supply Chain: an Holistic Approach, *International Journal of Materials and Product Technology*, vol. 11, n. 5/6, 1996, pp.464-76.
- Fisher Marshall L., Hammond Janice, Obermeyer Walter, Raman Ananth, Configuring a Supply Chain to Reduce the Cost of Demand Uncertainty, *Production and Operations Management*, vol. 6, n.3, 1997, pp.211-25.
- Fisher Marshall L., What Is the Right Supply Chain for Your Product, *Harvard Business Review*, march/april, 1997, pp. 105-16.
- Gattorna John L., *Strategic Supply Chain Management: Best Practices in Supply Chain Management*, Gower Publishing, Aldershot, 1998.
- Hau Lee, Aligning Supply Chain Strategies with Product Uncertainty, *California Management Review*, vol. 44, n. 3, 2002.
- Hills Stacey B., Sarin Shikhar, From Market Driven to Market Driving: an Alternative Paradigm for Marketing in High Technology Industries, *Journal of Marketing Theory and Practice*, 11(3), 2003.
- Hoekstra Sjored, Romme Jac M., *Integrated Logistics Structures: Developing Customer Oriented Goods Flows*, McGraw-Hill, London, 1992.
- Lambert Douglas M., Cooper Martha C., Pagh Janus D., Supply Chain Management: Implementation Issues and Research Opportunities, *International Journal of Logistics Management*, vol. 9, n. 2, 1998, pp.1-19.
- Lamoreaux Michael, Purchasing innovation VI: Crowdsourcing disponibile on line, 2006, www.esourcingforum.com.
- Langabeer Jim R., Rose Jeff, *An investigation of post-merger supply chain performance*, Oxford Chandos Publishing, 2001.

- Keegan Warren, Global Strategic Management, Kirpalani Vishnu H. (ed.), International marketing, Chicago, 1983.
- Kumar Nirmalya, Scheer Lisa, Kotler Philip, From Market Driven to Market Driving, *European Management Journal*, 18(2), 2002.
- McEvily Bill, Zaheer Akbar, Bridging Ties: a Source of Firm Heterogeneity in Competitive Capabilities, *Strategic Management Journal*, 20, 1999, pp.1133-1156.
- Mentzer John T., Defining Supply Chain Management, *Journal of Business Logistics*, vol. 22, n. 2, 2001, pp. 1-25.
- Mentzer, John T., Global Supply Chain Risk Management Strategies, *International Journal of Physical Distribution and Logistics Management*, vol. 38, n. 3, 2008, pp. 192-223.
- Monczka Robert M., Trent Robert J., Global Sourcing: a Development Approach, *International journal of purchasing and material management*, vol. 27, 1991.
- Monczka Robert M., Trent Robert J., Evolving Sourcing Strategies for the 1990s, *Distribution logistics management*, 1991.
- Narver John C., Slater Stanley F., MacLachlan Douglas L., Responsive and Proactive Orientation and New Product Success, *Journal of Product Innovation Management*, n. 21, 2004.
- Obstfeld David, Social Networks, the Tertius Lungen Orientation, and Involvement in Innovation, *Administrative Science Quarterly*, 50(1), 2005, pp. 100-130.
- Olhager, J., Strategic Positioning of the Order Penetration Point, *International Journal of Production Economics*, n. 85, 2003, pp. 319-329.
- Pepe Cosetta, Corporate Values in Global Supply Chains, *Symphonya. Emerging Issues in Management (www.unimib.it/symphonya)*, n. 2, 2007.
- Persson Goran, Logistics Process Redesign: Some Useful Insights, *International Journal of Logistics Management*, vol. 6, n.1, 1995, pp.13-25.
- Rainbird Mark, Demand and Supply Chains: the Value Catalyst, *International Journal of Physical Distribution & Logistics Management*, vol. 34, n. ¾, 2004.
- Rodan Simon, Galunic Charles D., More than Network Structure: How Knowledge Heterogeneity Influences Managerial Performance and Innovativeness, *Strategic Management Journal*, 25(6), 2004, pp. 541-562.
- Stern Louis W., El-Ansari Adel I., Coughlan Anne T., *Marketing Channels*, 5th ed., Prentice-Hall, London, 1996.
- Stevens Graham C., Integrating the Supply Chain, *International Journal of Physical Distribution & Materials Management*, vol. 19, n. 8, 1989, pp.3-8.
- Thomas Douglas J., Griffin Paul M., Coordinated Supply Chain Management, *European Journal of Operational Research*, vol. 94, 1996, pp.1-15.
- Tamer Cavusgil S., Yaprak A., Yeoh P.L., A Decision-Making Framework for Global Sourcing, *International business review*, 1993.
- Vallini Carlo, Simoni Christian, Market Driven Management as Entrepreneurial Approach, *Symphonya. Emerging Issues in Management (www.unimib.it/symphonya)*, n. 1, 2009.
- Van der Vorst Jack G.A.J., *Effective food supply chains; generating, modelling and evaluating supply chain scenarios*, Wageningen University, Wageningen, PhD-thesis, 2000.
- Walters David, Rainbird Mark, The Demand Chain as an Integral Component of the Value Chain, *Journal of Consumer Marketing*, vol. 21, n. 7, 2004.

Wilding Richard, The Supply Chain Complexity Triangle: Uncertainty Generation in the Supply Chain, *International Journal of Physical Distribution & Logistics Management*, vol. 28, n.8, 1998, pp. 599-6.

Notes

¹ The combination of pull and push policies and the benefits of integration are also treated as basic assumptions for the strategies of firms operating with logic market-driven management. See in this regard M. Corniani, Push-Pull Policies in Market-Driven Management, *Symphonya. Emerging Issues in Management* (www.unimib.it/symphonya), n. 1, 2008.