

Supply Chain Management: Some Issues and Challenges - A Review

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Abstract

India is becoming a global manufacturing hub. Increasing demand in domestic and international markets is opening a new world of opportunities for the Indian Industry. Increasing competition, due to globalization is making inevitable for the Indian industries to provide cost effective quality output with stringent delivery schedules. Issues in supply of inferior quality, delayed supply, unwarranted cost escalation, etc. would adversely impact the credibility and business potential of the Indian industry. Amongst many difficulties faced by Indian manufacturers, supply chain disruption management is a major issue, which can result in large tangible and non-tangible losses. In current study lot of research has been done to understand what the Supply Chain Management is and how it is affecting organizations, what are different challenges and it can be proved as a tool for improving overall performance in today's global competitive environment.

Keywords: Supply chain management.

1. Introduction

In the current competitive scenario supply chain management assumes a significant importance and calls for serious research attention, as companies are challenged with finding ways to meet ever-rising customer expectations at a manageable cost. To do so, businesses must search out which parts of their supply-chain process are not competitive, understand which customer needs are not being met, establish improvement goals, and rapidly implement necessary improvements.

The term 'supply chain management' has not only been used to explain the logistics activities and the planning and control of materials and information flows internally within a company or externally between companies (Christopher 1992, Cooper et al., 1997 and Fisher, 1997). Researchers have also used it to describe strategic, inter organizational issues (Cox, 1997, Harland et al., 1999), to discuss an alternative organizational form to vertical integration (Thorelli, 1986 Hakansson and Snehota, 1995), to identify and describe the relationship a company develops with its suppliers (Helper, 1991 and Hines, 1994, Narus and Anderson, 1995), and to address the purchasing and supply perspective (Morgan and Monczka, 1996 and Farmer, 1997).

Supply Chain Management is a reverse of prior practices where manufacturers supplied product to customers. Now customers tell suppliers how and when they want their inventory delivered. The driver behind Supply Chain Management is to remove inefficiencies, excess costs and excess inventories from the supply pipeline which extends from the customer back through

his suppliers and through his suppliers' suppliers and so on back. By having the program driven by the customer, it is hoped that inventories, caused by uncertainties and slow response, will be significantly eliminated. While there are sales incentives to major suppliers with the carrot of category management or similar programs, the success of supply chain management rests with logistics.

Functional areas of Logistics:

1. Network Design
2. Information Technology
3. Transportation
4. Inventory and Storage
5. Warehousing
6. Materials Handling, Loading and unloading
7. Packaging and Re-packaging

It should be noted that supply chain management has both "hard" (i.e., technical) and "soft" (i.e., people) aspects, reflecting the fact that the field is at the intersection of many disciplines, such as marketing, procurement, management, operations research, logistics, and so on. It might be supposed that social network analysis – originating as it does in social psychology – would have its greatest and most natural application on the soft side of SCM, helping to understand how patterns of personal relationships translate to competitive advantage through diffusion of information, social control of opportunism, coordination and aid and so on (Stephen P. and Xunli, 2009).

The initial benefits of supply chain management accrue to the customer, the initiator of his supply chain. He earns the reduction in inventories by driving out excesses inventories which he must purchase, store and be

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responsible for. The impact of supply chain management to the supplier may be more difficult to classify, initially, as benefits. They may vary, but may include:

- Fewer orders initially while the customer draws down excess inventories.
- Small and more frequent orders.
- Vendor carries inventory, not the customer.
- Higher warehousing costs for picking smaller and more orders.
- Higher freight costs for shipping smaller order and more orders.
- Penalties for not meeting the customer's requirements.
- Possible loss of business for not meeting the customer's requirements.

Suppliers play a crucial role because they help Indian firms to improve supply chain cost, responsiveness, reliability and its competitiveness. Therefore management of sourcing in terms of Supply Risks (i.e., delays in receipt of the material; or mismatch in quantity supplied; or material being of inferior quality or damaged; or the alteration in commercial terms delaying the supply) is very crucial. A solution to this problem is to manage supply delays by managing the supply risks. Supply Risk is defined as, "The potential occurrence of an incident associated with inbound supply from individual supplier failures or the supply market, in which its outcome results in the inability of the purchasing firm to meet customer demand or cause threats to customer life and safety". This means non availability of the required material at the required time in spite of the order being placed for input materials on time and delivery date / quantity / cost are agreed with the supplier well in advance as per the agreed norms.

If a company has one hundred customers, he may have one hundred customer practices. This is the most challenging job for SCM to keep all the customers satisfied rather delighted. Emphasis is presently on the initial customer-supplier link. (Ketkar and Vaidya, 2012) The effects ripple through the supply chain, it is more like a "whisper down the lane" impact, where suppliers are not clear as to their role and what they must do. Customers want more quality, design, innovation, choice, convenience and service, and they want to spend less money, effort, time and risk. The supply chain of a company consists of different departments, ranging from procurement of materials to customer service.

Supply Chain Management means transforming a company's "supply chain" into an optimally efficient, customer-satisfying process, where the effectiveness of the whole supply chain is more important than effectiveness of each individual department.

Previously manufacturers were the drivers of the supply chain - managing the pace at which products were manufactured and distributed. Today, customers are calling the shots, and manufacturers are scrambling to meet customer demands for options/styles/ features, quick order fulfillment, and fast delivery. Manufacturing quality – a long-time competitive differentiator - is approaching parity across the board, so meeting customer's specific demands for product delivery has emerged as the next critical opportunity for competitive advantage. Companies

that learn how to improve management of their supply chain will become the new success stories in the global market place. Study on Benchmarking shows significant cost differences between organizations that exhibit best-in-class performance and those with average performance.

Traditionally, Supply Chain Management (SCM) has been a melting pot of various aspects, with influences from logistics and transportation, operations management and materials and distribution management, marketing, as well as purchasing and information technology (IT). Ideally, the all-encompassing philosophy of SCM embraces each of these functions to produce an overall supply chain strategy that ultimately enhances firm performance (Croom et al., 2000 and Wisner and Tan, 2000). In actuality, the literature is still very fragmented and although several studies purport to discuss supply chain issues, most of the existing research only examines one link of the chain, or most importantly only focuses on one ingredient in the supply chain performance mix. Six major movements can be observed in the evolution of supply chain management studies. Creation, Integration, Globalization, Specialization Phases One and Two, and SCM 2.0 These phases are given in Table 1. The six stage evolutionary era depicts that in a particular era which strategy was emphasized. For instance in the sixth era information Technology was given priority and IT enabled supply chain was the burning issue.

2. Literature Review

Analytically, a typical supply chain (Figure 1) is simply a network of materials, information and services processing links with the characteristics of supply, transformation and demand. It is the collection and interaction of these elements that impact system-level qualities, properties, characteristics, functions, behavior, and performance (Cloutier et al., 2010).

Enterprises create and deliver products and services through increasingly global and complex supply chains (Binder and Clegg, 2007 and Basole and Rouse, 2008). The hyper-competitive nature of today's business environment, however, requires enterprises to continuously seek ways to decrease operational costs, provide satisfactory customer service, and minimize existing and anticipated disruption risks by designing and managing efficient supply chains.

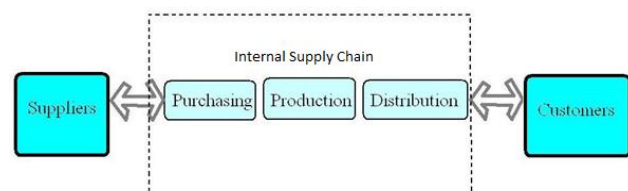


Figure 2.1: Company's Supply Chain

(John Storey, Caroline Emberson, Janet Godsell and Alan Harrison, 2006) in their paper "Supply chain management: theory, practice and future challenges" critically assess current developments in the theory

Table-1 Era in the Evolution of Supply Chain Management

S.No.	Era	Description
01	Creation Era	The term supply chain management was first coined by an American industry consultant in the early 1980s. However the concept of supply chain in management, was of great importance long before in the early 20 th century, especially by the creation of the assembly line.
02	Integration Era	This era of supply chain management studies was highlighted with the development of Electronic Data Interchange (EDI) systems in the 1960s and developed through the 1990s by the introduction of Enterprise Resource Planning (ERP) systems.
03	Globalization Era	This era is characterized by the globalization of supply chain management in organizations with the goal of increasing competitive advantage, creating more value-added, and reducing costs through global sourcing
04	Specialization(Phase one)	In the 1990s industries began to focus on “core competencies” and adopted a specialization model. Companies abandoned vertical integration, sold off non-core operations, and outsourced those functions to other companies.
05	Specialization Era(Phase two)	Specialization within the supply chain began in the 1980s with the Phase Two – Supply inception of transportation brokerages, warehouse management, and non asset based carriers and has matured beyond transportation and logistics into aspects of supply <u>planning, collaboration, execution and performance</u>
06	Supply Chain(SCM 2. 0)	Web 2. 0 is defined as a trend in the use of the World Wide Web that is meant to increase creativity, information sharing, and collaboration among users.

and practice of supply management and through such an assessment to identify barriers, possibilities and key trends. The paper reveals that supply management is, at best, still emergent in terms of both theory and practice. The paper identifies the range of key barriers and enablers to supply management and it concludes with an assessment of the main trends.

(Omera Khan and Bernard Burnes, 2007) in their study “Risk and supply chain management: creating a research agenda” develop a research agenda for risk and supply chain management. The paper shows that there are a number of key debates in the general literature on risk, especially in terms of qualitative versus quantitative approaches, which need to be recognized by those seeking to apply risk theory and risk management approaches to supply chains. In addition, the paper shows that the application of risk theory to supply chain management is still in its early stages and that the models of supply chain risk which have been proposed need to be tested empirically.

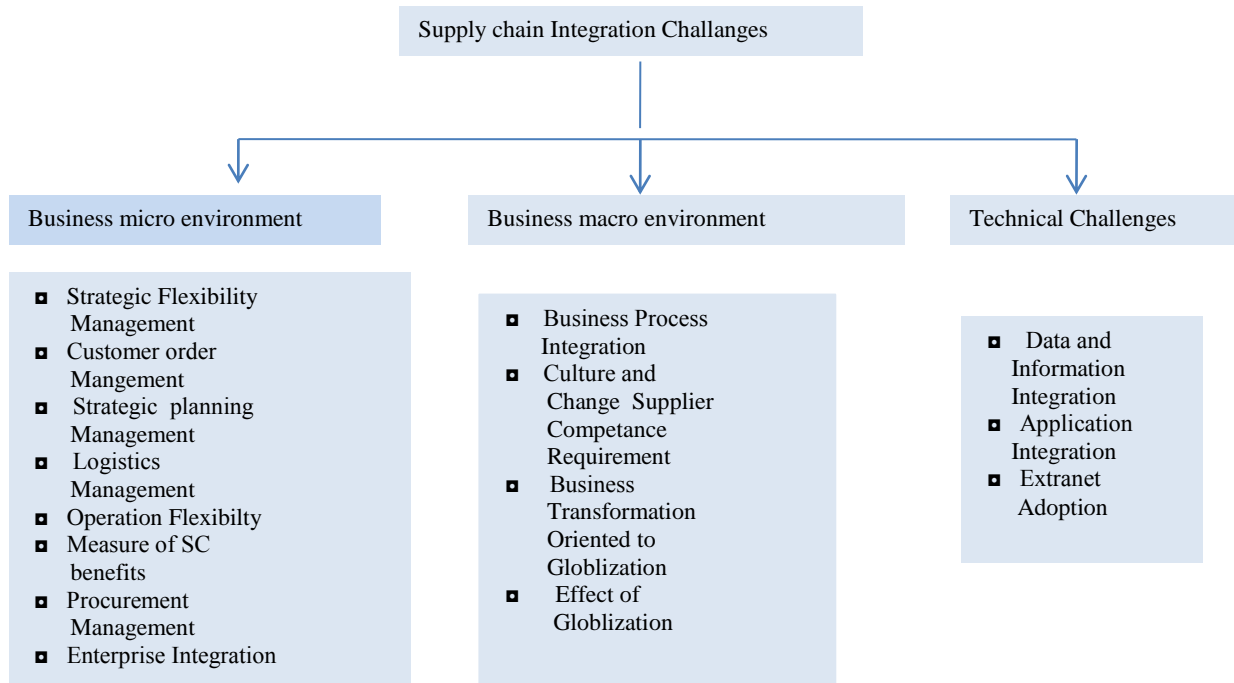
(Mary J. Meixell and Vidyaranya B. Gargeya, 2005) in their paper “Global supply chain design: A literature review and critique” they review decision support models for the design of global supply chains, and assess the fit between the research literature in this area and the practical issues of global supply chain design. The classification scheme for this review is based on ongoing and emerging issues in global supply chain management and includes review dimensions for (1) decisions addressed in the model, (2) performance metrics, (3) the degree to which the model supports integrated decision processes, and (4) globalization considerations. A supply chain design problem comprises the decisions regarding the number and location of production facilities, the amount of capacity at each facility, the assignment of each market region to one or more locations, and supplier selection for sub-assemblies, components and materials (Chopra and Meindl, 2004). Experts maintain that global supply chains are more difficult to manage than domestic

supply chains (Mac Carthy and Atthirawong ,2003).Substantial geographical distances in these global situations not only increase transportation costs, but complicate decisions because of inventory cost trade offs due to increased lead-time in the supply chain.

The origins of the notion of supply chain management (SCM) are unclear, but its development appears to start along the lines of physical distribution and transport (Croom et al., 2000) based on the theory of Industrial Dynamics.

As pointed (Tang ,2006) since nobody gets credit for fixing problems that never happened, firms do not invest in supply risk assessment exercise. If reward system rewards only those who achieve their objectives irrespective of due attention to risks, then managers will strive to achieve objectives at the cost of disproportionate risks (Manuj and Mentzer, 2008). Popular view is that since the firm has a greater control on the supplier, supply side uncertainty can be handled by choosing appropriate partners. However, certain events in the recent past have underscored the need to consider supply uncertainty (Zsidisin, 2000; Ruiz-Torres and Mahmoodi 2007). Measurement of performance of purchasing also seems to be difficult. (Tuncel and Alpan, 2010; Thun and Hoening 2011). Therefore, it appears that supply risk management is a bit under explored area. We also realize some specific challenges for suppliers in developing countries as they rely on a low cost strategy while they realize that they need to be innovative and also provide better services (Chong and Chan, 2011).

The quality of the material sourced from emerging economies is at par with the world standards. But the supply chain management best practices are not followed by suppliers. The problems faced by these firms from their suppliers are common viz. product shortage, delayed delivery, supply disruptions, lack of logistics facilities, etc. (Lin and Zhou, 2011; Thakkar, Kanda, et al., 2011). Therefore there is a need to percolate the best practices to second tier or third tier suppliers. As a whole chain they



need to perform better (Sutton, 2004; Soni and Kodali 2011). Indian firms and suppliers too are no different. They share the same approach of other firms in emerging economies. Indian organizations need to change the way people think. They need to change their mindset (Sahay and Mohan, 2003; (Thakkar, Kanda et al., 2011; Soni and Kodali, 2011). We realized that first hand information from the people responsible for supply chain management in Indian industries should be gathered to analyse the supply risk management perspective and practices implemented by them. This information would also reveal the degree of importance given to this area by Indian firms. A limited number of risk related surveys can be found in the area of supply chain (Thun and Hoenig, 2011).

In current study lot of research has been done to understand what the Supply Chain Management is and how it is affecting organizations, what are different challenges and it can be proved as a tool for improving overall performance in today’s global competitive environment.

3. Issues and challenges in supply chain

3.1 In Supply Chain Integration

Supply chain management (SCM) executives face unique challenges, with respect to integrating supply chain-specific strategies with the overall corporate business strategy. In recent years, given changing business realities related to globalization, the supply chain has moved up on the chief executive officer’s (CEO’s) list of priorities, but it’s not always for the right reasons, in many cases, CEOs only pay attention to the supply chain when they want to cut costs or when something is wrong. Since the supply chain essentially moves the lifeblood of the organization, process efficiency on a global scale is essential to optimized business operations. The importance of global

integration to the Multi-National Company (MNC) lies in the differential advantage to be gained from the ability to exploit differences in capital and product markets, to transfer learning and innovation throughout the firm, and manage uncertainty in the economic or political environment in different countries or regions. However, the general understanding of the business environment in most industries is that competition has increased and the conditions under which business is made are more turbulent. Many researches have mentioned a classification of supply chain integration challenges. SC integration challenges can be classified through the challenge of system relationships; the SCM system has two kinds of relationships, which are the relation between sub-systems, and the relationship between SCM system and the business strategies, This classification emphasizes the technical challenges that came from the relation between SCM system and internal business strategy, unfortunately this classification bypass the challenges that the companies may face from external environment.

3.2 In Information Sharing

Information sharing in a supply chain faces several hurdles. The first and foremost challenge is that of aligning incentives of different partners. It would be naïve of a partner to think that information sharing and cooperation will automatically increase his or her profit. In fact, each partner is wary of the possibility of other partners abusing information and reaping all the benefits from information sharing. For example, supply chain partners seldom share information that relates to sensitive cost data, e.g.

production yield data or purchase price of parts. This is consistent with economists. Finding that a powerful monopolistic or monopsonistic partner can extract all economic profit from his or her partner, but one way of defending a positive profit for the weaker party is to keep

the cost hidden and maintain informational superiority. The profit associated with superior information is often called *the informational rent*.

Even when each partner is guaranteed a positive gain in return for information sharing, each partner can play a non-cooperative game and haggle over how *much*. This may potentially lead to a failure to share information. Thus, trust and cooperation become critical ingredients in a supply chain partnership. On the other hand, trust needs to be rationalized by a relevant economic return. Cooperative game theory offers a starting point to the resolution of the problem, but reality is much more complicated with many additional factors and special considerations. Another concern associated with information sharing is the confidentiality of information shared. Suppose, for example, that a supplier supplies a critical part to two manufacturers who compete in the final product market. Either manufacturer would not share information (like sales data) with the supplier unless it is guaranteed that the information is not leaked to the other manufacturer. But the situation becomes tricky if the supplier and one of the two manufacturers are the same company. Note also that information sharing in certain settings can be a subject of antitrust regulations. Suppose that two retailers regularly share with the supplier their demand projection for the next ten weeks. The projection by one retailer may implicitly signal the plan of a sales/promotion campaign in some future week. When this information is relayed to the other retailer through the supplier, it may be potentially used as a price fixing instrument between the two retailers. For example, the two retailers may take turns lowering the price by the use of forecast signals and avoid cut-throat price competition. This practice may be a subject of scrutiny by the antitrust authorities. Again, but for a different reason now, the supplier must make sure that the shared information will not be used beyond the original intent. Technology is another constraint in information sharing. Implementation of a cross-organizational information system is costly, time-consuming and risky. Partners may not agree on the specifications of the technical system, e.g., EDI standards, or how to split the cost of investing in the system. The timeliness and accuracy of the shared information could be another major hurdle. PC manufacturers often complain about not being able to get accurate sell through data from their resellers. Some resellers share such data on a monthly basis, but then the definition of a month varies by resellers - some from the first day of the month to the first day of the next, some from 15th to 15th, and so on. In addition, some resellers would share the data on a weekly basis. Since the manufacturers are interested in the aggregate sell-through data of their products, significant efforts are needed to ensure consistency of the aggregated data. Finally, we should note that information sharing is only an enabler for better coordination and planning of the supply chain. Hence, companies must develop capabilities to utilize the shared information in an effective way. We have heard that some manufacturers demand POS data from the retailers, but then did not know how to make use of the data to improve their forecasts. Consequently, the benefits of information sharing were not fully realized.

Information sharing will continue to form the basis of supply chain integration. Current advances in information technologies will accelerate such a practice.

3.3 In Supply Chain Network Design

Another aspect that requires more attention is the full integration of forward and reverse activities in SCM. As we can conclude from the surveyed literature, only a few papers attempt this integration and, again, significant simplifications are made (e.g., a single product or deterministic parameters are considered). One aspect that has been scarcely considered in (integrated) supply chain planning concerns postponement decisions, which refer to the possibility of not filling customer demands on time. As a result, backorders are generated that incur penalty costs. This issue was explicitly integrated with strategic decisions (Wilhelm et al., 2005) Clearly, more research is needed on this aspect, whose relevance has been raised by SCM. In particular, it is important to consider the impact that it may have on strategic decisions. In addition to these findings, we note that the large majority of location models within SCM is mostly cost-oriented. This somewhat contradicts the fact that SCND decisions involve large monetary sums and investments are usually evaluated based on their return rate. One of the few models addressing this issue was (Sheu, 2003) focusing on maximizing the potential return on facility investment. Moreover, substantial investments lead to a period of time without profit. Companies may wish to invest under the constraint that a minimum return will be gradually achieved (e.g., at least a pre-defined amount should be earned within a given time limit, (Shapiro, 2004). By considering profit-oriented objective functions, it also makes sense to understand, anticipate and react to customer behaviour in order to maximize profit or revenue. This means bringing revenue management ideas into strategic supply chain planning. The contribution by Mitra, 2007 is the only example we found that considers revenue management for remanufactured products in reverse logistics.

Regarding the methodology that has been developed to solve SCND problems, a rich and varied group of available solution techniques can be observed. This aspect along with the continuous development of more computing power makes it possible to handle comprehensive models. Hence, although the incorporation of the various features discussed above would naturally increase the complexity of the resulting models, the possibility of solving real-life problems seems quite promising. The main conclusion that can be drawn from this review is that we can find a growing stream of research aiming at the integration of strategic and tactical/operational decisions in supply chain planning. Moreover, the role of facility location is decisive in supply chain network planning and this role is becoming more important with the increasing need for more comprehensive models that capture simultaneously many aspects relevant to real-life problems. Nevertheless, much research is still needed in order to include in the existing models many issues that so far have not received adequate

attention in the literature. Therefore, there is still much room for the development of new models (and solution techniques) for helping the decision-making process in integrated supply chain planning.

4. Discussion of Findings

More than 25% of purchase orders are not shipped as planned or are not delivered as planned. This significant statistic presents a real opportunity to reduce waste. Supplier performance and supplier lead times are important areas for potential waste reduction and process improvement. Also, the distribution network may be outdated. It may have been built years before with different store or customer configurations, different products, and other topics. It may have been built when the focus was on storing inventory in warehouses, unlike now when inventory velocity is emphasised. Touching the product to store it often adds only time – a waste result, not value (see map at bottom of facing page). Bypassing warehouses with cross dock or other transfer facilities at ports can remove time and inventory. Supply chain execution technology can give visibility from the purchase order through to delivery order. It can provide the way to allocate product in transit. Making this part of the new process reduces two key wastes – time and inventory. Global supply chain management has significant "built-in" time because of the distance involved. This runs counter to domestic supply chains. The extended time can, in turn, create uncertainty and the need for many companies to build and carry additional inventories. Yet time and inventory are two areas of waste for lean to improve. So lean international logistics faces an additional challenge because of its inherent scope and the impact throughout the supply chain, especially within the company. Identifying non-value added activities is especially important for worldwide supply chain management. Any activity that adds time and inventory and cost to the already complex activities can obstruct supply chain effectiveness. Value stream mapping is a tool for seeing and identifying waste, both internal and external. Seeing the current activities and the waste can form the basis of plans to improve the supply chain. This procedure is especially critical for high-volume and high-margin products where the impact on the company bottom line is significant. Collaboration and co-operation within the company organization and between and among trading partners is important for truly removing waste across the entire supply chain. Accelerating cycle time, increasing inventory velocity and reducing costs for the high-volume and high-margin products can affect return on investment and drive the benefit of lean for everyone to see. Value stream mapping provides an important tool for understanding the present supply chain and designing a new one.

Supply chain management (SCM) should be an integral part of the company's drive and direction. SCM represents the way to customer retention and growth, competitive advantage and profitability. Successful supply chains have top management approval and support. Value stream mapping is a picture of the process or what is used

as a process. The lack of a real process can create waste, or non-value-added activity. Global supply chain waste occurs as unneeded cycle time, inventory and cost. The cost waste often appears in the transportation and warehousing activities.

It is easy to place responsibilities on external parties without understanding what your company does to trigger their actions. See where the process is being forced to fit your company or some other entity and, as a result, creates significant waste. Designing the new process requires clear analysis and thinking beyond traditional logistics. Otherwise, one flawed process can replace another flawed process.

5. Conclusion and suggestions

Assessing supply chain performance leads to identification of problems and opportunities. Having a strategy and measuring key parts are necessary to understand and take control of your supply chain. Put the process, people and technology in place to create competitive advantage, both for today and tomorrow. If you do not, a competitor will. Supply chain success involves process, people and technology. It gives definition to the company purpose. It enables all participants to know what is required. This in turn provides agility to handle exceptions and to adapt to changes. Having those three elements is important to having metrics, ones that are useful across the organization. All three working together in a company provides coordinated, unified effort to use supply chain management as a driving force in customer satisfaction and in having competitive advantage, with service and productivity.

Effectively managing inventories requires proper process, people and technology. It means integrated management of the supply chain from the suppliers' doors right through to the customers' docks. Inventory should move, not sit in warehouses and plants. Inventory velocity is key to supply chain success, company profitability and shareholder value.

Senior management may not speak of logistics in their corporate goals and programs. But logistics is often a key factor in the success of these. Logistics must exercise a leadership role in demonstrating creative vision and programs to top management. Be committed to the corporate programs. Make sure your corresponding logistics programs are aligned with and support the corporate plans. Supply chain management is here. It is not about shipping orders; it is not about making product then pushing it out the door. Supply chain management is about developing a process to respond to the different requirements of each customer. Customers are driving suppliers' practices. Being successful requires logistics effectiveness. Customers, competitors and vendors are global. This is an exciting challenge and opportunity for companies who see the potential and make it happen. At one time, suppliers dictated how they would accept and ship orders to customers. No more, now customers are dictating to their suppliers how they will handle their orders. Turnaround time. For each action, there is an equal

and opposite reaction. So it is with supply chain management-type programs. Management should understand the programs that each of their customers have and what it means to their company.

* Recognize that supply chain management has different meanings in different industries. The importance of transportation cost or inventory or information technology can impact the design and operation of the logistics process.

* Understand what each of your customer wants and why. Each customer may have his own requirements. Know them. Ask questions. Communicate internally and work together. *Reduce your internal total logistics cycle time, with purchasing, manufacturing, customer order and shipping, to have product ready and available for delivery to the customer. *Develop and communicate to your suppliers what you are doing, why you are doing it and what you expect of them. Learn their processes to help you design the best one. *Learn your international supplier's operations and logistics cycle time. The lead-time with international sourcing and its impact in inventory and on operations makes this very important.

* Inventory levels. Inventory stands out on the balance sheet. This is true whether it is raw materials, packaging, MRO, work-in-process or finished goods.

Inventory ties up working capital, capital which may have alternative uses to benefit the company.

* Unclear Mission. Supply chain management requires a rethinking of the company and the logistics mission. Is it customer or is it cost? These can be conflicting goals. Saying the mission is service, then measuring it by cost can cause organizations to lose focus on what must be done. Supply chain management is a new concept and requires a reassessment of what the company is doing, where it is going and how it wants to get there.

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