

Improved Supply Chain Performance Through Visibility and Forward Vision

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The challenge to supply chain professionals in all industries and government sectors is to move from the mechanical aspects of the supply chain process to transforming the process to meet organizational strategies and goals. Government-related process managers focus on budget realities and bringing best practices to improve mission readiness. The sole reason to change process performance is to impact organization strategies. Interestingly, the units of measure for each step represent increments of 10. Changes in IT tooling are typically measured in hundreds of thousands to millions. Process improvements are measured in millions to tens of millions. Enterprise-wide impact is measured in hundreds of millions to billions. Effective process change to elements of materiel management has an impact unit of measure in the tens to hundreds of millions.

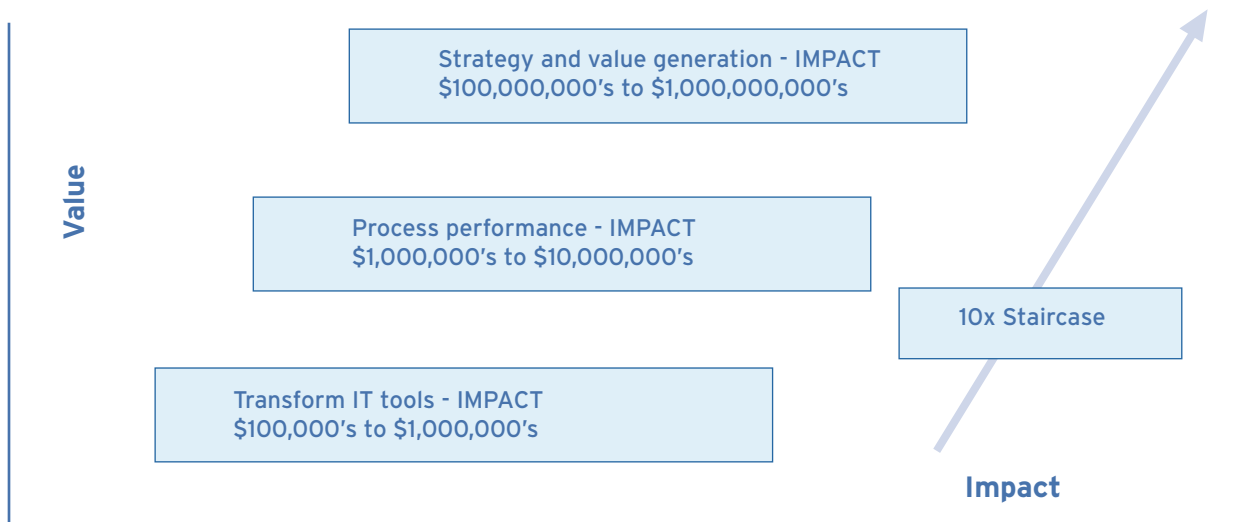
A supply chain professional could also be known as a “visibility integrator,” serving many trading partners and operating many systems to deliver many goods to many people. A one size fits all approach does not work. Supply chains have surprising commonality across organizations.

Today's supply chain professional relies on global IT systems to provide process vision. Tomorrow's supply chain professional will face required process performance specifications that are defined, exact and linked to organization strategies. Visibility will be tied to the IT architecture that will be flexible and able to integrate with allies, partners, other agencies and the people being served. Supply chain management is and will remain a core enabler to organizational performance.

Supply Chain Management is a mature discipline and has been at work in industry and government for some 20 years. It has matured to include process models, executive ownership, strategy awareness and major execution and planning systems. The challenges for supply chain professionals is in the identification of those initiatives that are required to address present performance improvements and meet future needs. The challenge to supply chain professionals in all industries and government sectors is to move from the mechanical aspects of the supply chain process to transforming the process to meet organizational strategies and goals. Large organizations are in a continuous state of transforming to meet future needs. Commercial points of view revolve around impact on

revenue and cost and earning. Government-related process managers focus on budget realities and bringing best practices to improve mission readiness.

Transformation work is often needed to firmly attach change initiatives to the ultimate value to the organization. **Figure 1** shows how a supply chain professional needs to look at proposed change initiatives. Since so many aspects of supply chain improvement are dependent on information technology (IT) tools, the attachment begins in the lower left with IT foundational changes (infrastructure and applications). The reason to make tooling changes to IT is to drive process improvement. The sole reason to change process performance is to impact

Figure 1. Business Value Stair Step

organization strategies. Interestingly, the units of measure for each step represent increments of 10. Changes in IT tooling are typically measured in hundreds of thousands to millions. Process improvements are measured in millions to tens of millions. Enterprise-wide impact is measured in hundreds of millions to billions. Thus global mission readiness through more effective global materiel readiness involves an asset and spend assumption in the hundreds of millions to billions. Effective process change to elements of materiel management has an impact unit of measure in the tens to hundreds of millions.

Even though it is a mature discipline, there remains a need by those managing supply chains and those dependent on them for better visibility. It will be the premise of this article that better visibility is a result of improved vision and requires integration to assemble the collection of operational prisms required to see the supply chain in all its various colors. The vision to be addressed is the ability for an organization to take the inputs, outputs and work in process within the supply chain and use that information to improve performance, deliver service and, in many cases, drive changed behaviors. Vision is two way - from supply chain managers looking outward and inward at their own processes and those of trading partners and from the viewpoint of those being served by the supply chain to understand the flow of materials they are delivering or receiving. The goal of supply chain vision is

to improve and optimize the performance of the supply chain for all stakeholders. Shared information is the key to improve understanding and collectively improve results. The fact that supply chains are sometimes called value chains indeed implies that the mission is to deliver value to all in the chain. The emergence of service-oriented architecture (SOA) for IT have helped supply chain process managers to position their requirements for IT Transformation. **Figure 2** on page 40 is a representation of the four major SOA elements: front plane, cross plane, back plane and core services. Visibility improvements are manifest in the front plane, but it is the linkages to data in the cross plane and Enterprise Applications in the back plane and, potentially, the feeds to core services that do the work to make improved visibility a reality.

Working with any large enterprise involves an understanding of the nature of that organization and its place in the world of other large organizations. Success in addressing the needs and desires for improvement in large-scale operations requires clear understanding of the culture and the various organizational tribes at play. The word "agenda" takes on a new meaning when dealing with large companies, agencies and associations. Supply chain professionals go through extensive training to understand the relatively straightforward concepts of capitalism - buy low, sell high, collect early, pay late and hold little in inventory. What supply chain managers seldom

Figure 2. Supply Chain Service-Oriented Architecture



understand are the nuances of cultural anthropology, politics and control that accompany the supposed logic of business execution. The issues governments and their agencies face in supply chain management call into play an interesting set of factors that combine to determine the success of a supply chain agenda.

The first factor is the mission of the government supply chain agency and its geographic scope. Whether military, humanitarian, cultural or commercial, more governments are supporting global missions. Globalization is a way of thinking, organizing and acting. It differs from regional or international constructs in that a global operation and mind-set assumes using resources from around the world and buying services from those best suited for delivery to the mission. How, therefore, do we define thinking about supply chain management from a global perspective?

For purposes of our discussion, the term “globalization” refers to and, in particular, assumes that it:

- views all locales in a similar manner using similar processes, systems, rules and governance
- is differentiated from regional management where things are done differently in one place when compared to other regions

- leverages all locales for their strengths and fosters and applies the benefits derived to other sites
- manages the resources (human, materiel, financial) as a single collection available to all
- builds an organizational and operational culture that assumes a model that is inclusive of the diversity of resources and opportunities from all locales.

Is your organization multinational or global? Do your processes execute policy region by region or across the globe? Do you know how your enterprise operates based on regional, national or other geographic metrics, or are there global metrics?

Once past the rhetoric of globalization and delving more into how we look at supply chain management on a global scale, there emerges a very common topic. How does an organization get visibility of its supply chain performance? How does an enterprise integrate its various outputs into coherent sets of performance data to assist decision-making and mission accomplishment?

Case Example A general officer of a large military branch announced that he wanted unprecedented visibility of materiel issues to soldiers. The staff took that “commander’s intent” and quickly baked the sound bite into the request

for proposal it was seeking. Respondents to the request just as quickly asked the following:

- If you want unprecedented visibility, what did you have before?
- How are you measuring change from the precedent of past systems to the unprecedented desire for future systems?
- What do you do with the information?
- How is visibility to be scoped? (what's on hand now; recent issues; expected issues; orders incoming)
- What is most important to you? (issues of individual items, soldiers served, units served, budget expended and allocated).

As the discussions transpired, the answers came back as follows:

- We received a spreadsheet of issues in the past.
- We would like an updated spreadsheet in the future.
- We evaluate our inventories from past issues.
- We do not look at goods on order, issues planned and scheduled.
- We monitor individual issues against stock changes.
- We do not have definition of how to use the information for decision making.

Synopsis The general holds a staff meeting with his staff entering the room walking and looking backward. Decisions are based on the past even in the face of changing conditions. The general is actually measured against unit equipment readiness but is measuring performance based on the lowest common denominator: canteens and belt buckles on a site-by-site basis.

Postlogue What had originally driven the desire for a proposal was the desire to consolidate inventories across a geographically dispersed network; to attain knowledge of the inventories, orders and consumption of goods from various theaters to impact decision support; and to leverage all stocks to better impact unit readiness.

Attaining visibility is more akin to attaining vision and less about generating a history of actions in need of the

normal cultural editing required to explain why the same outcome has been repeated even in the presence of such daring strategies as “organizational transformation.” The vision required in the supply chains of global enterprises refers to the vision required to actually change the way an organization behaves for the better. Visibility via historical spreadsheets is formalizing insanity, such as doing the same thing over and over and expecting different results. Visibility through improved vision is the challenge.

Two well-known adages can be applied to governmental bodies that bear witness to how we discuss improved vision relative to supply chain management.

“All politics is local.” Former U.S. House Speaker Tip O’Neill¹

It is well known that Napoleon prized the ability of his generals to know terrain.

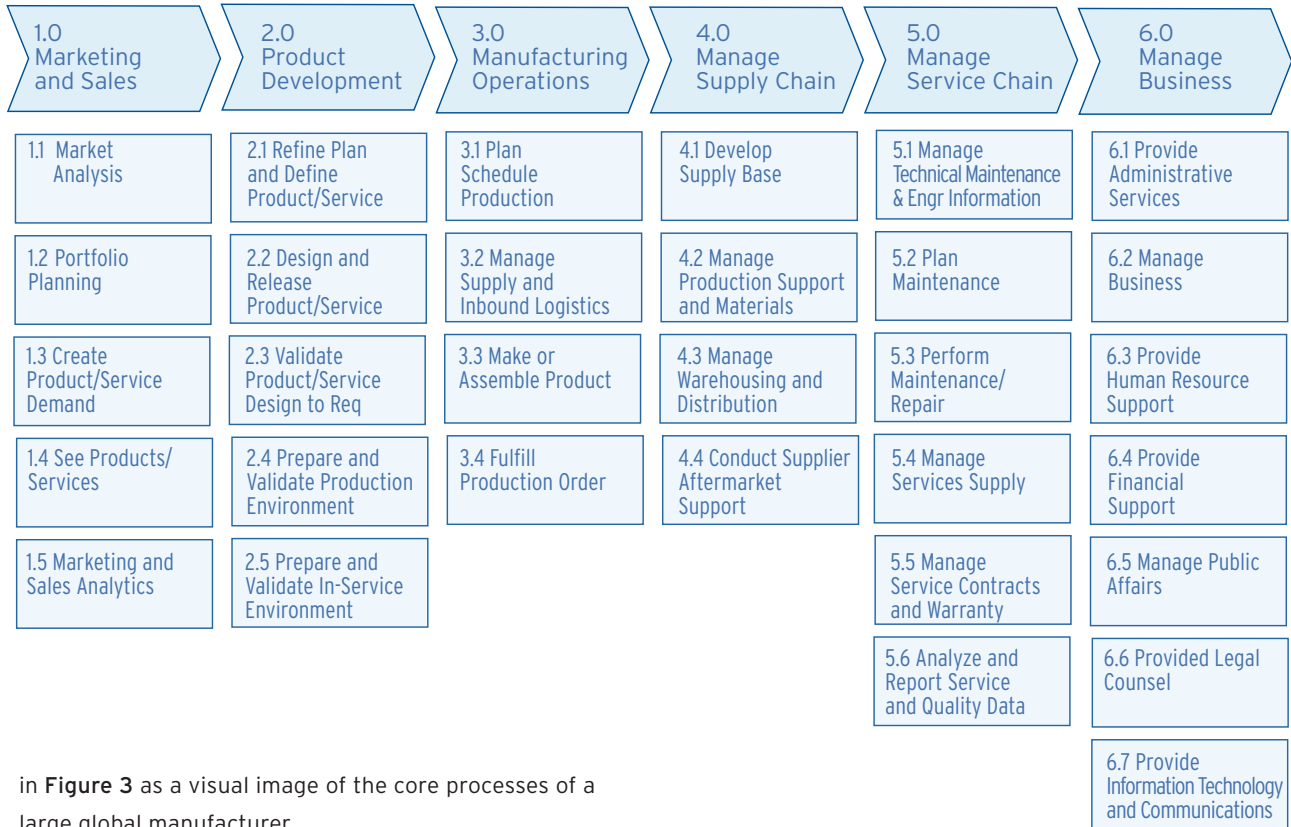
Politicians and their bureaucratic executors live in a world where they are locally judged by the electorate on their ability to deliver goods, immediate relief in times of disaster and victory on the battlefield. Results can be seen, felt, used and believed. Supply chain professionals faced with those missions of delivering relief or warfighting materiel understand all too well the need to fulfill another axiom: “To get there firstest with the mostest.” But “there” is often a long way away and the “stuff” required no longer sits in piles in warehouses. That “stuff” is in the supply chain. Our government sources its goods globally because the companies from which governments buy, although usually of same national origin at headquarter levels, also source their material globally.

Agencies plan and even war-game reactions to events but not many exercise vision tests on their supply chain as standard operating procedure. The following is a discussion of how large organizations can strengthen their supply chain vision.

Begin with the processes used by the organization. A manufacturer serves as a good example of a multi-process enterprise and one interestingly akin to a large governmental agency. Many processes intermingle to design, source and produce a product for consumption. An Integrated Manufacturing Enterprise model is offered

¹ The Thomas P. O’Neill, Jr. Papers, Archives and Manuscripts, “Biographical Note.” John J. Burns Library, Boston College, 15 August 2006; available from http://www.bc.edu/bc_org/avp/ulib/oneill_findingaid2.html#a2; Internet; accessed 06 November 2008.

Figure 3. EDS Manufacturing Industry Framework



in **Figure 3** as a visual image of the core processes of a large global manufacturer.

Figure 3 details at a high level the major domains at work and play in the global manufacturer. These can be grouped in a way that shows the breadth and depth of major domain efforts and how boundaries from domain to domain interplay.

Using the terms less as definitions of IT systems and more as descriptions of process sets, **Figure 4** shows that:

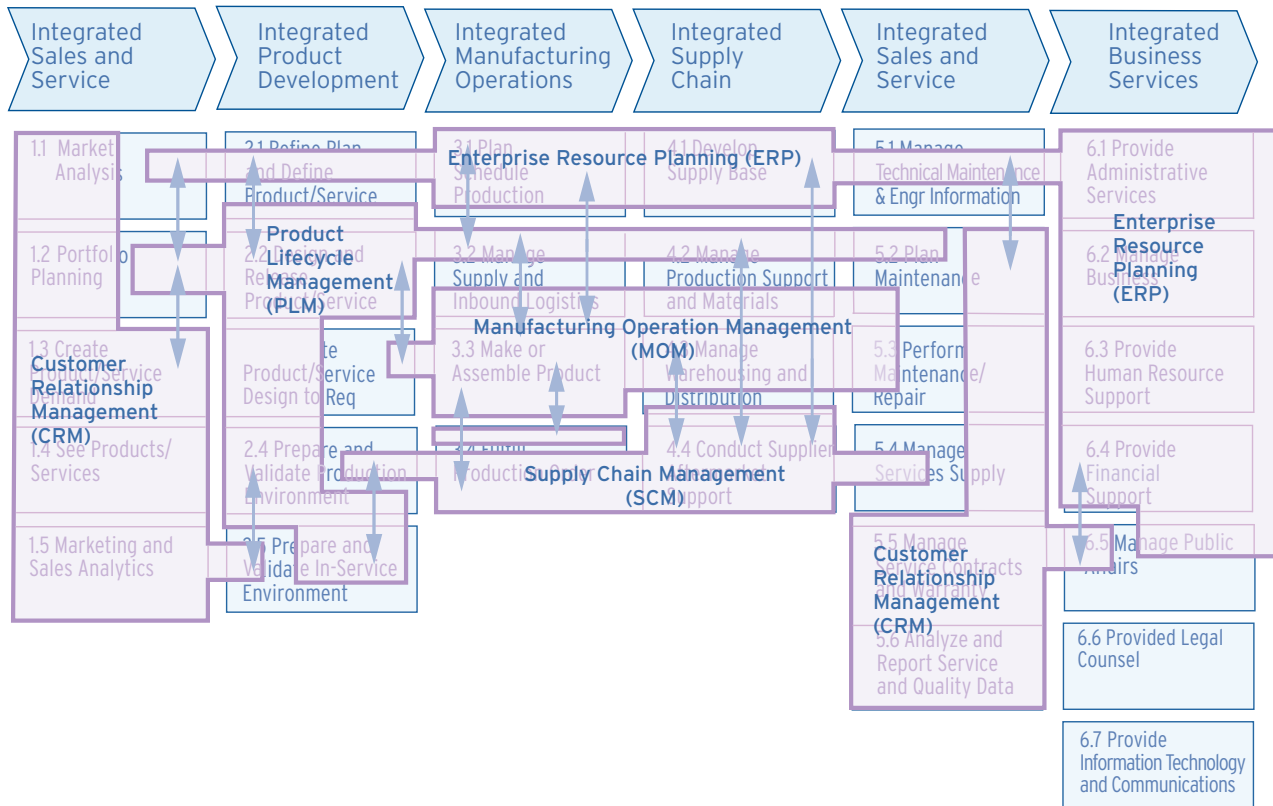
- enterprise resource planning spans from the sales forecasts to the aftermarket support.
- product lifecycle management predominates itself in the design phase with connections to and from resource planning and customer support.
- manufacturing operations are decidedly the center of mass but depend on resources, material supply, good design and customers for whom to build.
- managing customers transcends the establishment of demand and the fulfillment of the demand.
- supply chain takes the demands, the designs, the resources and the requirements of the manufacturing

and sources, moves, stores and restores the stuff that goes into the stuff we buy, sell and need.

There has been further adaptation of well-known supply chain models like the Supply Chain Council’s Supply Chain Operational Reference (SCOR) model, resulting in a process model that matches the needs of clients in various industries, but with a view toward the reality that global supply chains are enabled and, indeed, dependent on a global IT nervous system to execute and manage. **Figure 5** details an adapted Supply Chain Framework.

The first step in improved vision is to use such a reference model to understand the terrain of the supply chain under examination. The global supply chain professional thinks broad and deep: across from the customers’ customers to the suppliers’ suppliers and deep into the processes engaged. Understanding the concept of process breadth begins the differentiation of the supply chain challenge. Attaining visibility in a modern world is a function of understanding the data that is pulled

Figure 4. EDS Integrated Manufacturing Framework



from the skin and analyzed. Those threads of data are held in various systems, governed by various entities and dependent on the technologies of players who are often in separate organizations.

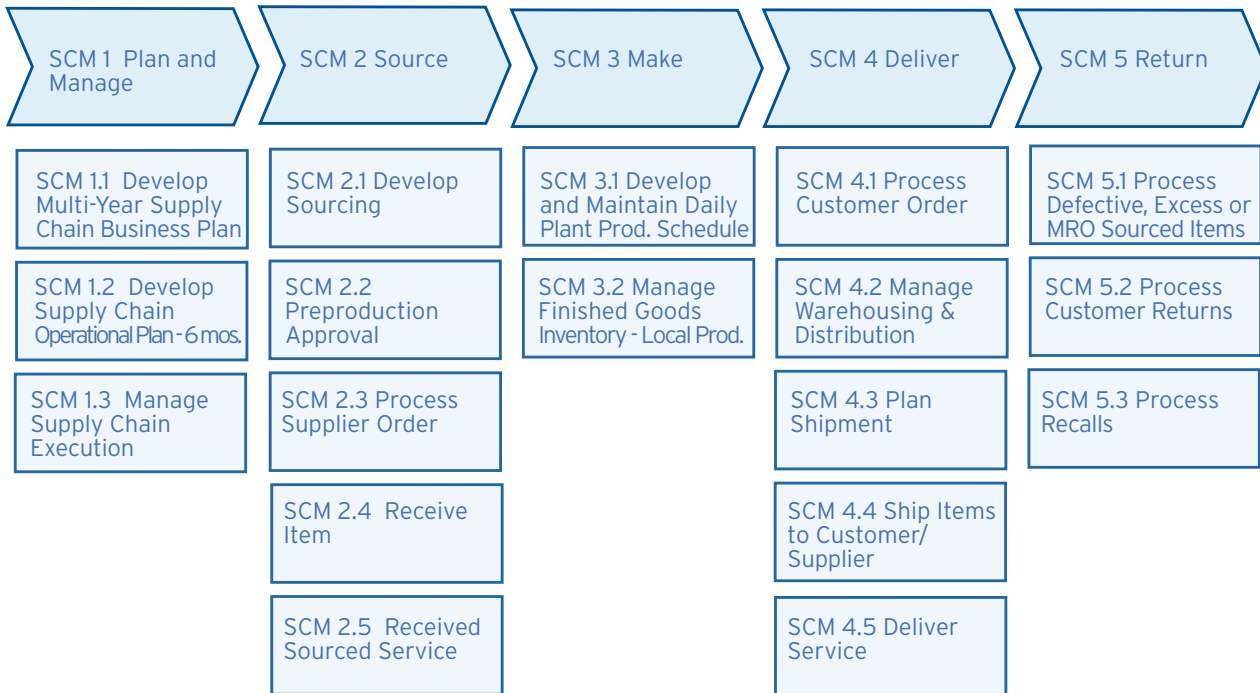
The second step to improve vision is to understand the rules, controls issues and infrastructure under which supply chain professionals operate and upon which they rely. A simple case study illustrates the elements of analyzing a process to improve visibility through improved vision.

Case Example An organization was faced with the movement of recipe-based material from the point of manufacture in Kansas City to the point of process use in Mexico. The material was moving from one division of the company to another division through contract carriers. The transit time ranged from seven to 12 days. The company and its trading partners had no reliable visibility as to where the product was in the process nor why the transit time was so long or why there were such wide variances in transit time.

Analysis The process used by the enterprise was a simple one known to many and detailed at a high level by models as shown above. Plant shipping department to carrier, to freight yard, to carrier, to border, to customs, to another carrier, to freight yard, to local delivery, to user plant receiving. Simple, until one looked at the other supply chain: the data. The data and format of the shipment in the originating plant were not the exact data in the same format as that of the carrier, nor of the customs house nor of the subsequent carriers. The transit time was not a function of travel of goods but of transfer of data, and delays occurred every time an exchange of data occurred.

Solution Understanding the entire supply chain process involved understanding the rules by which the culture of this one supply chain operated. Each member “tribe” had its own language as shown in its own data. Each passage of data from “tribe” to “tribe” required a translation. Where accountability was audited, as at customs, seemingly simple descriptions of the product, if slightly different, could stop the flow. Add this “supply chain

Figure 5. EDS Supply Chain Framework



language” barrier to the fact that, of more than 300 customs brokers at the border, only a handful were IT capable to handle systems generated communications. The vision and solution required were found in the normalization of shipment data through a consortium of supply chain partners including shippers, carriers, customs brokers and government agencies and the attainment of an origin to destination transit time of three days. If time is money, there was benefit by looking at the supply chain from the standpoint of who needed visibility and how they viewed the transaction - physically and as a shipment of data packets. All affected parties agreed to the data, a system was designed so those same parties could see the position and status of the data since all were using the same rules and the members of the consortium “owned” the rules for the transit trades.

A simple method has been developed to address organizational issues of processes and their associated systems. That operational assessment methodology involves five major elements:

- the business processes involved in the organization
- the IT applications serving those processes

- the underlying technologies on which those applications run
- the organizational elements involved
- the governance of the processes and systems.

These five elements affect the enterprise vision as shown in the case studies and many others of similar, but far wider, impact. Global vision in a global enterprise supply chain is a function of all the players, the elements and the entire process with the host of systems accompanying the processes and organizational entities. No single and independent action is a panacea.

Enterprise Resource Planning (ERP) systems are implemented by many and are, indeed, designed on the premise of integrated modules. How many companies still run on battalions of clipboard commandos using spreadsheets to expedite transactions? How many defined processes are shared across trading partners? How many supply chains can connect to the Tier 2 or 3 suppliers for visibility of vital resources or material? Enterprises want to collaborate but not many actually can by virtue of flexible business rules to foster sharing and the systems that can link to trading partners.

Many organizations have addressed situations similar to the above through communized trading messages as found in Electronic Data Interchange (EDI). Others have updated systems that integrate or provide portals through the Internet. Some global organizations that face global clients like the military or airlines have adjusted from regional-based management models to thinking more in a global mind-set.

The third step toward improved vision is to understand what is the mission of the supply chain in question and how does one define success.

Supply chain professionals and their IT counterparts are often asked to serve the needs of their large clients who have strategies to:

- achieve global and common systems
- take many sites into a single organizational model
- rationalize and modernize systems
- achieve single instances of large systems to leverage skills and resources

These are worthy goals and, in supply chains serving the protection and enhancement of lives as faced by government agencies, they become critical. It is the experience of facing similar desires from organizations across the globe that leads a supply chain professional to propose an examination of the following critical success factors for global organizations to achieve improved supply chain visibility.

1) Understand and clearly define the mission and metrics that will determine success (hard measures matter, including time, money, things). If change is desired, then from what to what?

2) Understand the global span from which material is sourced and the factors that impact performance to the mission, including:

- a. Critical material requirements and process time to procure and produce
- b. Supplier capacity
- c. Factors of tuning the flow, both increasing and decreasing

3) Understand the logistic elements of where it is coming from and where it is going to, such as:

- a. Availability of transport, time and distances
- b. Process steps that impede flows

4) Understand the “reality map” of systems that really control the supply chain and how well these elements talk to one another. One may publicly identify one’s organization as an ERP-driven company, but how many other systems operate alongside the major applications package?

5) What does a “perfect order” look like? Does supply chain planning assume the “perfect order” compliance? What is Plan B?

These are critical success factors in terms of vision and visibility because they drive the supply chain manager to define the following:

- What do I need to see and why is it important to me?
- When I see it, what can I do to speed / slow; add / reduce; change / stabilize?
- On a very tactical basis supply chain managers will be asked to:
 - reduce lead time
 - reduce inventory levels
 - reduce obsolete stores
 - improve fill rates
 - optimize transport and logistics
 - improve the management of exceptions.

Understanding the role of visibility and the need for vision to achieve improved performance are the keys to improving supply chain performance. Supply chains must address tactical requirements and evolve to understand the future and strategic needs of the organization and how it must be served by the supply chain of the future. Vision provides the tactical problem solver and the strategic planner the ability to address issues because the stakeholders can see the problems through process visibility, clear metrics across a global span with rules and systems that support the ability to leverage tools, resources, finances and materiel on a scale wider than at any time in the past.

A supply chain professional could also be known as a “visibility integrator,” serving many trading partners and operating many systems to deliver many goods to many people. A one size fits all approach does not work. Supply chains have surprising commonality across organizations thus the longevity of models like SCOR. What dynamics are at play among the organizations across supply chains, across changing physical, economic and political conditions? Security concerns have driven ways to address shipment security and visibility of transit modes. Supply chain disruptions from disasters, man-made and natural, drive desires for supply chain visibility of alternative commodities or technologies, sourcing networks, distribution and pipeline inventory alignments and new routes from origin to consumption. Stuff happens; things change and supply chain managers need the visibility to manage change. How the supply chain professional uses visibility is, in general, to enable change in the way the organization behaves, including its sources, ships, stores, schedules. Changing behavior relies on the combined systems serving the breadth and depth of the supply chain systems and the extraction of relevant data into information that can be used to make decision and serve missions. Today’s supply chain professional relies on global IT systems to provide process vision. Tomorrow’s supply chain professional will face required process performance specifications that are defined, exact and linked to organization strategies. Visibility will be tied to the IT architecture that will be flexible and able to integrate with allies, partners, other agencies and the people being served. Supply chain is and will remain a core enabler to organizational performance. Organizational performance will be something for which continuous improvement will be revealed in budgets and mission expectations. ■