

Managing The Supply Chain for Profitability

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Companies don't compete with each other. Supply chains of those companies compete with each other. Is this a relevant and accurate statement? Are there examples of this type of competition occurring in the process industries? Does the supply chain of your organization effectively compete with your competitors?

Many organizations in the process industries have considered these questions and know that the answers lie in the following:

- Definition of the supply chain
- Supply chain strategies
- Roles and responsibilities of the functions involved in supply chain activities
- Metrics of performance used
- Overall results obtained

We will consider each of these elements in the balance of this article.

Supply Chain Management

Generally speaking, a supply chain represents all the activities starting from the decision to create a new product or service for a customer, and ending with the ultimate delivery, installation, and conduct of customer service tasks (or after-sales support). This definition has been referred to as the "Motorola" definition, indicating how this world-class company approaches its supply chain management work.

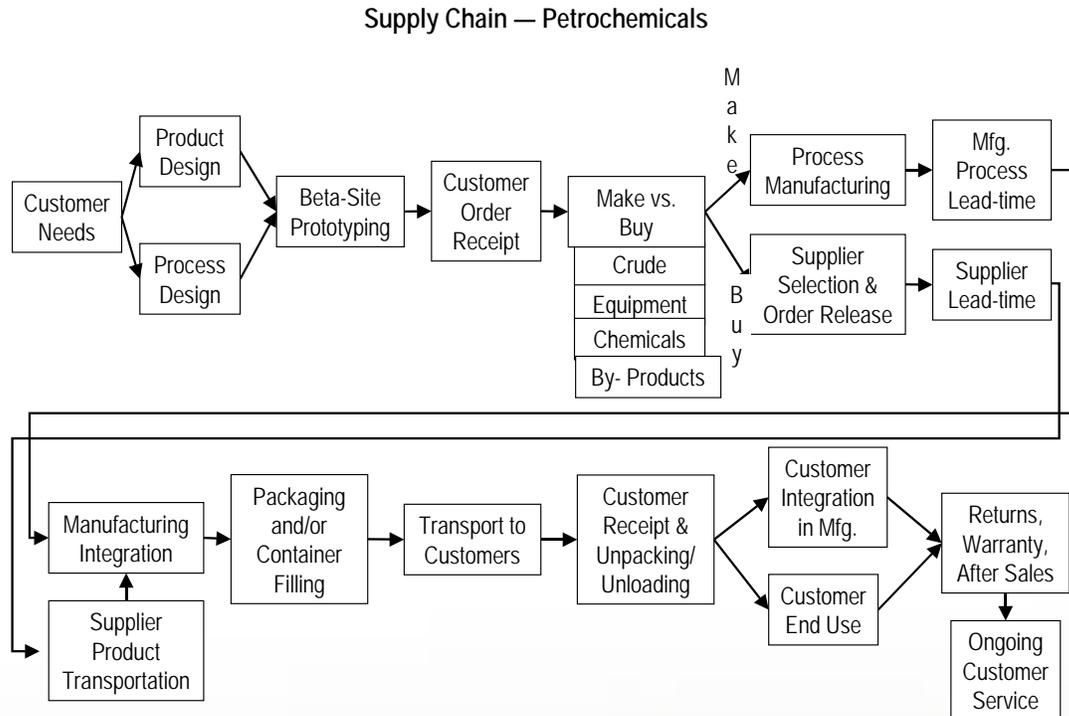
There are derivations of this definition including those that use one of the following:

- Receipt of customer order to product shipment
- Signoff of product design to first customer delivery
- Transmission of an order to a supplier to the delivery of that supplier's product or service to purchaser

The last definition really refers to the supplier's lead-time, not the broader definition alluded to for Motorola.



Perhaps a graphical depiction of a supply chain for a petro-chemical company may provide a more tangible example for the process industries. The flowchart below describes the various steps in getting products to customers.



By conducting a more detailed analysis of the supply chain, one could evaluate the overall lead-time, quality, customer satisfaction, feasibility, and innovation of these steps and processes.

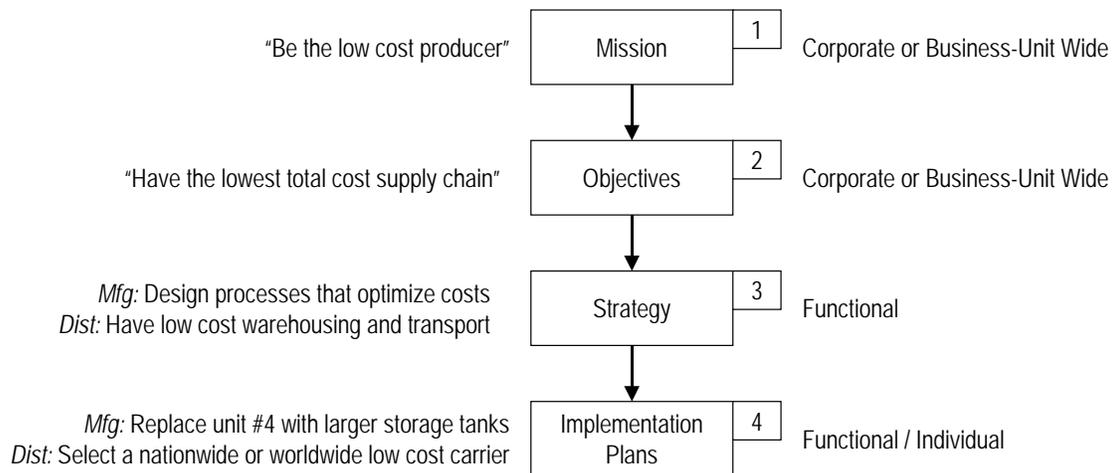
A best practice is to consider the broadest definition possible. This ensures that effective plans can be put in place to improve supply chain performance.

Supply Chain Strategies

Since the broad definition encompasses research, manufacturing, operations, marketing/sales, distribution, quality, and service, an aligned supply chain strategy across these functions must be developed to ensure that the organization receives the direction necessary to optimize the chain. So what are the dimensions of these strategies?

Most strategies are developed in the overall context of the direction setting process of an organization. Typically, strategies are developed after the organization or business unit mission is constructed. The flowchart below indicates this process as well as an example of the supply chain influences:





In the chart above, strategic components fall into boxes 3 and 4. Our work with clients has focused on the management of the implementation plans as the establishment of the mission and objectives are relatively simple, compared with the fastidiousness needed for implementation.

Other key strategies pertaining to the supply chain include:

- Establishing partnerships with key customers and suppliers
- Designing standard processes or products
- Establishing an e-business supply line linking customers and suppliers
- Lower total costs of ownership
- Create an enterprise-wide resource planning system to coordinate the activities of the supply chain
- Develop a professional SCM workforce
- Establish a responsive supply base
- Maintain a return-on-assets of at least 3.0
- Lower absolute inventory levels while increasing availability
- Develop and maintain lean or agile manufacturing practices

Other strategies would be established by other functions. The business unit or the organization would adopt the totality of those strategies as its complete SCM strategy.

Roles and Responsibilities

One concept is clear and compelling regarding the roles and responsibilities for SCM execution and performance: it's across the enterprise. Think in terms of a chain-linked fence. If any of the links break, or are not strong enough to perform its function, then the entire linked fence un-performs. This is true of a supply chain in the process industries:

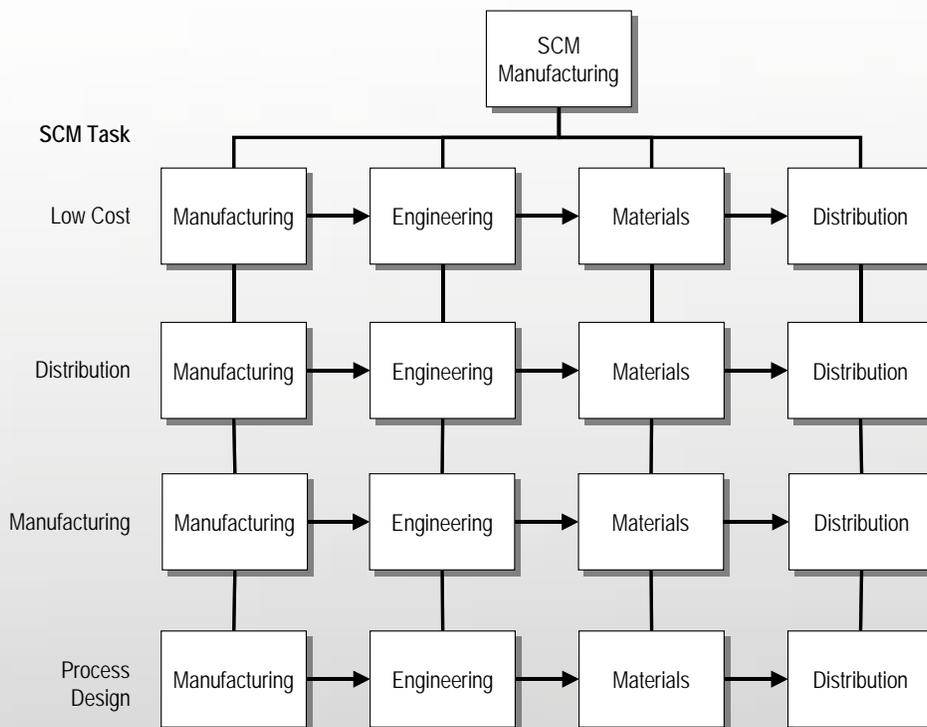


the combined strength of the entire chain will result in operational performance. Some of the “breaks” in the chain include:

- Poor Design → High Warranty Costs
- High Quality Defects → Low Yield, High Production Costs
- Product Can't Be Scalable → Missed Deliveries and Poor Quality
- Undependable Transport → Rejected Shipments
- Invoice and Acknowledgement Errors → Low AR turnover

It is incumbent for companies for companies to rid themselves of supply chain deficiencies. This is only possible if there is a shared responsibility for SCM results. Given the decentralized nature of chemical companies; in particular, the emergence of shared services across business units, how is this possible?

Roles and responsibilities and the accompanying accountability must be agreed upon internally, put in job descriptions, incorporated in SCM measures, reported on by SCM staff, and evaluated and analyzed by top management. This process could typically look like this:



The sum of the parts will produce a result greater than that sum due to the alignment, consistency, and goals associated with agreed upon roles and responsibilities. Supply Chain Management is a shared responsibility.

When a major U.S. petrochemical company needed alternate crude oil capability, a joint, cross-functional group encompassing all functions was tasked with ensuring the complete solution from establishment of a joint venture in Venezuela, integration in manufacturing, demand/pull analysis, transport, delivery, and all customer service issues. This team was established for 14 months and in the process beat target “in-channel” costs by 10% and completed start-up activities three months ahead of an already accelerated schedule.

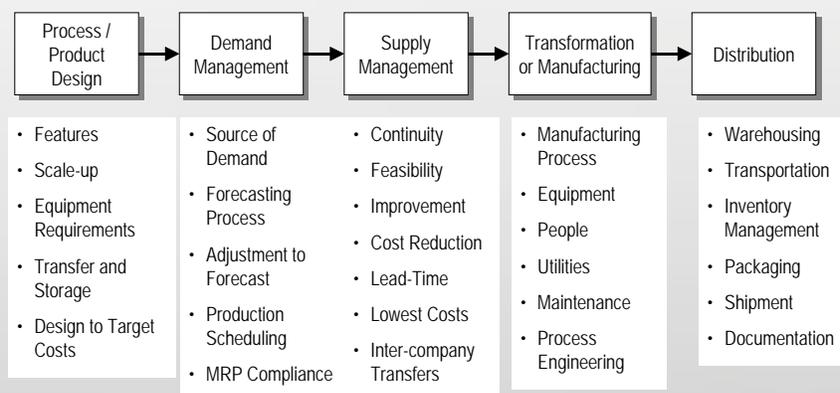
When a specialty chemical plant pronounced it wanted to be a “world-class” plant, the staff at the plant aligned itself across disciplines and product lines. They first established the plant mission, set forth five very clear objectives dealing with cost, innovation, quality, product and service, and then deployed the objectives using a concept commonly referred to as “policy deployment” or “Hoshin planning.” The disciplines then had to translate the five objectives into the language of their discipline, create sub-objectives, and then establish implementation plans. The plant was awarded “best manufacturing plant” categorization.

Lessons learned from these experiences include:

1. The roles and responsibilities must be written;
2. Accountability is best given to teams;
3. No more than seven objectives should be established;
4. Include every function, including sales
5. Top management must review status regularly, as part of established meetings

(One of our client’s Presidents established a practice of providing monthly face-to-face “all hands” meetings at the plant to review SCM performance as well as overall company performance)

6. All five steps of the supply chain must be included:



7. Middle managers must re-enforce the SCM behavior. For example, Supply Management should not try to find the lowest purchase price when those suppliers may not have high quality. Another example is engineering designing a process that is not capable of low cost and/or high quality given the company's core competencies.

Supply Chain Management must be a core competency for all chemical, oil, petrochemical, and all similar industries due to the high percentage of costs associated with manufacturing costs, and the impact of improvement on bottom line productivity. Typically, a 1% improvement in SCM efficiency means a 12% improvement in before-tax profitability. Training and development plans should be established to ensure that the core competency is established.

Metrics Used

Most people would agree that “what gets measured gets done” by companies. Without effective SCM measures, there either will not be the right level of attention given to SCM, or that there will not be the incentives present to ensure that there is alignment within the organization for improvement.

There are many metrics or measures that can be chosen by organizations to evaluate their supply chain activities. Most world-class companies use metrics that measure activities, not functional tasks. Find a metric that applies to the work of more than one function. For example, manufacturing cycle time. The engineering, manufacturing, supply management, quality, and distribution disciplines all should share in the success or failure of that metric.

Other excellent examples of SCM measures include:

1. Cash-to-Cash Cycle — Measuring the amount of the time between payment of the suppliers to receipt of payment from the customer. Dell Computer has a negative cash-to-cash cycle time.
2. Total Costs: This includes all the costs of managing the cycle chain:
 - Design
 - Sales
 - Manufacturing
 - Supply Management
 - Distribution
 - Service
3. Supply Chain Responsiveness: Measures the duration of time between when the demand for the company's products increases a specified percentage



(many companies use 20-30%) and the cycle time for the supply chain to respond to those requirements.

4. New Product/Process Introduction: The amount of time from concept to first production in scale-up mode. A Company like Monsanto uses this measure.
5. Warranty/Claims: This measure captures the cost of customer returns, complaints, satisfaction, and even customer retention.

It is interesting to observe that the U.S. Automotive Industry is studying this measure very carefully and we will see early implementation of their concept in the process industries.

6. Inventory Used For Sales: This measure only counts the inventory that is used in sold products, and doesn't consider out-of-mix stock or other raw, WIP, or finished goods stock.

Specific metrics should be established to meet specific company goals. Typically, these goals fall into one of six categories:

1. Cost
2. Quality/Features
3. Cycle Time
4. Innovation
5. Service
6. Responsiveness

Care should be given to receive buy-in on all measures by top management across all functions so that those measures are meaningful and re-enforced within the organization.

Overall Results

So what are the world-class SCM results that would be meaningful to your business? First, it does depend on the type of business you are in and the market requirements. It also does depend on the size and breadth of the organization, and the number of product lines and plants. But it doesn't have to do with your industry! Don't discount best practice performance because it's an example for an automotive company or a computer manufacturer. Consider how they focused on that performance measure to achieve the noteworthy results.



Given the qualifications, here are some examples of SCM results:

Toyota	<ul style="list-style-type: none"> ▪ 248 inventory turns
Selectron	<ul style="list-style-type: none"> ▪ Six sigma quality ▪ 7 ppm defects from suppliers
Shell	<ul style="list-style-type: none"> ▪ Lowest injury rate ▪ Safety training
Dell	<ul style="list-style-type: none"> ▪ 25 suppliers ▪ 10 days inventory ▪ Negative cash-to-cash cycle <p>(They get paid by their customer, before they pay suppliers)</p>
Honda	<ul style="list-style-type: none"> ▪ 50% suppliers have perfect quality ▪ \$1,200 cost savings per vehicle from previous model
United Technologies Corporation	<ul style="list-style-type: none"> ▪ \$1.2 billion supply management savings ▪ 60% improvement in manufacturing efficiencies

These are just a few of the achievements of companies that look at the entire supply chain. Why are there not as many process industry companies on this list? Because the SCM focus has not been given within many large chemical, oil/gas, and other process industry companies. Why not? I think that there is an historical segregation of engineering/research activities and operations; as well as a disconnect between operations and the after-sales support and service. In the process industries, think:



Summary

Supply Chain Management activities are extremely influential in company profitability — a 1% reduction in SCM costs could represent a 12% profit improvement. That's a 12 to 1 relationship in cause and effect terms.

SCM must be a core competency, have an integrated strategy that is shared by many corporate functions. Roles and responsibilities for managing and interacting on the supply chain must be established along with the appropriate metrics that energize the organization.

World-class SCM performance must be compared against company performance to evaluate gaps and causes. Goals can then be established for improvement.

The SCM value proposition is lower operating costs, increased customer satisfaction, and higher profitability due to:

- High performance products
- Exceptional quality
- Extreme responsiveness
- Low operating costs
- Quick cycles
- Low wasteful activities

With the advent of the Internet and other communication mediums such as wireless technology, the information about your SCM can be now easily broadcast and shared with a larger community.

The future of SCM in the process industries is now!

