
Integrated Supply Chain Management

Optimizing Logistics Support

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Optimizing Logistics Support

Today's information-driven, integrated supply chains are strategic assets that support innovative warfighting capabilities—enabling organizations to reduce inventory, add product value, extend resources, accelerate time to market, and retain customers.

Integrated supply chain management is a proven business strategy that has gained wide acceptance in recent years due to increasing customer demands for quality, delivery, and speed. New and radical ways of communicating, coupled with cost reduction and more interdependent supplier, provider, and customer relationships, have contributed to the emergence of an integrated supply chain approach.

Supply chains can exist in both manufacturing and service organizations, and they are principally concerned with the flow of products and information between supply chain member organizations (procurement of materials, transformation of materials into finished product, and distribution of that product to end customers).

Today's information-driven, integrated supply chains are enabling organizations to reduce inventory and costs, add product value, extend resources, accelerate time to market, and retain customers.

A well-run household

An integrated supply chain is similar to maintaining

an efficient household. Every household is equipped with items such as stoves, refrigerators, washing machines, etc. that require maintenance, upkeep and repair, and may eventually obsolesce. Other consumable items, such as clothing and food, will need to be purchased more frequently. Owners of the house must decide on an ongoing basis what items should be purchased and over what time periods. These decisions will be affected by past use, known and anticipated needs, changes in cost and availability, the budgetary constraints of the household, and other factors. Because household money is spread out over a given period, expenditures must be thoughtful and prudent in order to get the most value out of every dollar spent.

DoD logistics programs and operations totaled about \$84 billion in FY2000, accounting for about one-third of the Department's budget. This rivals the cumulative operations of the 10 largest corporations worldwide.

The business supply chain, although more complex, works in much the same way . . . every step in the process, from identifying a customer need to final consumption, is an opportunity to save money, extend longevity, and enhance the effectiveness of goods and services.

The Heart of Supply Chain Management

“Delivering the right product to the right place at the right time and at the right price.”

The Impact

When applied in the private sector, supply chains have demonstrated superior customer responsiveness at about half the cost. Industry experts estimate that supply chain costs approach 75% of an organization’s total operating budget. Effective management of the supply chain not only improves the flow of materials from the perspective of the end user, but it also reduces logistics costs.

In the public sector, integrated supply chains play a critical role in optimizing logistics support and in improving management of secondary inventory. Secondary items include reparable parts (expensive items such as hydraulic pumps and navigational computers that can be fixed and used again); spare parts that support weapons systems; and commodities such as subsistence, medical materiel, and clothing.

DoD logistics systems, often referred to as the “logistics pipeline” or “supply chain,” involve several interrelated activities that play a role in providing parts where and when they are needed. These activities include the purchase, storage, repair, and distribution of parts, including consumable components that are used to fix reparable parts and end items such as ships and aircraft. All of these activities require substantial capital investments in personnel, equipment, facilities, and inventory.

The Benefits of Supply Chain Management

Effective supply chain management can impact virtually all business processes, leading to continuous improvements in areas such as data accuracy,

reductions in operational complexity, supplier selection, purchasing, and warehousing and distribution. Other benefits include:

- Quicker customer response and fulfillment rates.
- Greater productivity and lower costs.
- Reduced inventory throughout the chain.
- Improved forecasting precision.
- Fewer suppliers and shorter planning cycles.
- Improved quality and products that are more technologically advanced.
- Enhanced inter-operational communications and cooperation.
- Shortened repair times and enhanced equipment readiness.
- More reliable financial information.

“Logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet customers’ requirements.”

—The Council of Logistics Management

Recognizing Interdependencies

Traditionally in the private sector, marketing, distribution, planning, manufacturing, and purchasing functions have operated discretely. Manufacturing operations, designed to lower costs and maximize output, rarely took into consideration how this might impact inventory and distribution capabilities. In an integrated supply chain, there is coordination among the different players—rather like a relay team, where each player is correctly positioned for the handoff. GAO has noted that efforts to reengineer a logistics system are more successful when various logistics

activities are viewed as a series of *interconnected processes* rather than isolated functions. Changes in one element of the supply chain are likely to affect the cost and/or performance of other processes. For instance, when an airline modifies the way it purchases parts from suppliers, it must consider how those changes might affect mechanics in repair workshops.

Failure to account for all the processes in a supply chain can have negative repercussions across

business areas. For example, inaccurate customer forecasts for depot level reparable can affect a variety of process areas, including supply management, transportation, distribution depots, and depot maintenance. These interdependent relationships among business areas create an environment where as many as four business areas could have a discrepancy between actual workload and the level of allocated resources based on anticipated workload. This in turn will have an impact on the cost of commodities and, ultimately, upon mission support readiness.

Department of the Navy's Supply Chain



The Navy has identified four interrelated cycles in its supply chain:

- **Planning**—Includes the forecasting of demand for items, and supply and distribution planning
- **Sourcing**—Includes identifying sources of inventory to support acquisition, repair, and other services
- **Delivery**—Involves ordering, storage, and transportation
- **Maintenance**—Includes repairing weapon systems and component parts

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Key Steps in the Supply Chain

The University of Tennessee, in conjunction with the Defense Logistics Agency (DLA), developed the following key steps in a typical supply chain, along with critical questions and actions that should be taken at each stage:

1. Need Recognition

Purpose: to identify need

Questions to be answered:

- what material is needed?
- who needs it?
- when is it needed?
- where is it needed?

Trigger/action: create the order request

2. Sourcing

Purpose: to identify the source for need

Questions to be answered:

- where is material available?
- when will it be available?
- how much does it cost?

Trigger/action: create the order

3. Pre-Shipment

Purpose: to prepare the order for shipping

Steps to take:

- prepare picking documents
Trigger/action: picking process
- specify packaging and label requirements
Trigger/action: requisition of packaging materials
- specify documentation
Trigger/action: printing of documentation (hazmat, export, etc.)
- specify staging area for equipment

4. Transportation Planning

Purpose: plan transportation

Questions to be answered:

- does the shipment require special transport?
- can the shipment be consolidated?
Trigger/action: consolidation activity
- is backhaul available?
- does shipment require expediting?
- which carrier will be used?
Trigger/action: scheduling of carrier

5. Transportation

Purpose: transportation management

Questions to be answered:

- when was the shipment picked up?
- when is it expected to arrive?
- where is shipment now?
- when was shipment delivered?
- who received the shipment?

6. Receiving

Purpose: to manage the receiving process

Questions to be answered:

- what is received?
- when is it received?
- what should be done with the receipt?

Trigger/action: placement of receipt

- what was done with the receipt?

7. Issuing

Purpose: to coordinate issuing of products

Questions to be answered:

- when is material to be issued?
- who is material to be issued to?
- how is material to be issued?

Trigger/action: picking, packing, and delivery instructions

8. Consumption (Use)

Purpose: use reporting and record updating

Questions to be answered:

- who used the material?
- what was it used for?
- when was it used?
- where was it used?
- was material attached to something else?

Trigger/action: need recognition to return cores, scrap, or obsolete items

*Developed by the University of Tennessee and the Defense Logistics Agency
(Departments of Marketing and Logistics and Transportation)*

Understanding the Process

The term “supply chain” first appeared in literature as an inventory management approach. Commercial businesses had been encountering a demand for greater levels of responsiveness and shorter cycle times for delivery and inventory of goods and services (placing, preparing, storing, and fulfilling orders). The notion of “the perfect order” required that the supply chain provide nonstandardized, quality products quickly and efficiently every time. Since holding of inventories can cost as much as 40% of their value, their efficient management is crucial.

As with any business process, supply chain management can benefit from the principles of reengineering. It is necessary for organizations to have a thorough understanding of how their existing supply chain works, as well as the processes of their suppliers and the needs of their customers, and to establish a performance measurement system after reengineering has occurred.

In scrutinizing an organization’s internal processes, it is a good idea to look at only those processes that are deemed most vital, and to map them out with flowcharts or other visual illustrations. Supply chain maps or “blueprints” should depict all the various supply chain entities and their key processes. They should also identify the supply chain member organizations (suppliers and customers) considered most critical.

Common supply chain performance areas:

- Products and services
- Cost
- Customer service
- Delivery
- Assets utilized
- Sales
- Responsiveness
- Quality
- Cycle times
- Warehousing

Cycle Times

A key aspect of supply chain management is cycle time. Cycle time refers to the total time required to complete a process. Much of this can be wasted time or time that is not used efficiently. A number of factors can impede cycle time: redundant steps;

activities that may have been in place for a long time but no longer add value; activities that are done consecutively rather than in tandem; ineffective or poorly utilized technology; excessive bureaucracy (procedures, controls, and forms that stagnate the process); and poor communication, coordination, and cooperation.

Customer Wait Time (CWT), also called Logistics Response Time, is a specific cycle related to the time from when a customer orders an item until it is delivered (filling a requisition). A high-level metric that can drive improvements through the supply chain, Customer Wait Time is an effective performance measure for a variety of logistics processes. It looks at what is stocked locally, what is stocked elsewhere, how long it takes to repair or procure items not in stock, how long it takes to ship material, how long it takes to receive shipments, and other factors.

‘Total Asset Visibility’

Another way to reduce inventory and protect DoD customers against longer response times, is Total Asset Visibility. This refers to a combination of systems enhancements and business rules that allow managers to gather information about the quantity, location, and condition of assets anywhere in the supply chain and apply that information to fill customer orders without initiating new purchases. Maximizing current inventory reduces the need to buy more.

When cycle times are reduced, it can mean less inventory, less rework, and less overhead, all of which directly impact an organization’s overall cost structure.

Improving cycle times

The following have been identified as ways to improve cycle times:

1. Use of the Internet to expedite and track requisitions;
2. Focus on using single contractors, rather than many;
3. Reduction of the amount of secondary items in the pipeline;

4. Selection of “prime vendors” or “virtual prime vendors” who can provide market-ready or commercial supplies to a wide range of customers;
5. Use of “business case analysis” (comparing the costs and benefits of the current logistics support process with the estimated cost and benefits of the proposed alternative approaches) to select sources for long-term total life-cycle support (development, production, operational support, and disposal); and
6. Use of activity-based costing analysis to determine areas within the organization that could benefit from reengineering.

Case in Point

U.S. Army Transforms its Logistics

The Army’s logistics system has long had a reputation for being cumbersome and unreliable. Responsible for moving massive amounts of supplies and materials and employing thousands of army personnel and outside contractors, it was deemed inefficient and expensive. And it was doing a poor job of meeting changing customer needs. Since the early 1990s, the Army has brought its logistics performance to a worldclass level. Today, it takes less time for an Army repair depot to get a spare part from an Army supply depot than from a commercial vendor. The Army’s streamlined system now delivers spare parts in half the time it took to deliver them just a few years ago. To enhance performance along the supply chain, the Army has instituted an improvement method consisting of three key steps:

1. **Define the process**—Identify customers and their needs; break major processes into subprocesses; and walk through the various steps of the process to improve understanding of how it works
2. **Measure the process**—Develop metrics developed to gauge how well the process is done—overall performance in terms of time, quality, and cost. These metrics isolate problem areas, monitor the effects of changes to rectify the problems, and provide feedback to those implementing the changes.

3. **Improve the process**—With a new understanding of the process, customer needs, and performance measures, goals for improvement are set.

Velocity management

Under its traditional approach to logistics, the Army kept vast quantities of supplies—spare parts, ammunition, vehicles, etc.—on hand “just in case” they were needed. But stockpiling is no guarantee that combat forces will get what they need when they need it. Since 1995, the Army has been using a logistics technique called “velocity management,” which emphasizes velocity over mass, quality over quantity.

Velocity management improves the speed and accuracy with which materials and information flow from providers to users. This in turn reduces the need for massive stockpiles of resources. The result has been impressive. Accelerated deliveries of spare parts have accelerated the repairs of equipment. Improved inventory management has provided customers with ready access to a broader array of product choices. And financial management systems have become less cumbersome. The Army has seen velocity management improve a variety of processes, including:

- Expedited deliveries;
- Shortened repair times;
- Smarter stocking of inventory; and
- Increased equipment readiness.

“Worldclass firms have demonstrated superior responsiveness to customer needs through integrated supply chains at about half the cost of their average industry segments.”

—GAO (NSIAD-00-1)

The Role of Information Technology

Because today’s managers must make decisions in “real time,” an organization is exposed to higher risk and may suffer penalties, such as losing a valuable customer or mission-critical supplier, if decisions are wrong. Therefore, it is imperative that they have all the information they need—quickly and accurately.

Information and communications technologies are revolutionizing the scope and scale of e-supply chain infrastructures. Online data exchange is transforming business practices, allowing managers to capture and track complex data more effectively. Orders and various products related to that order can easily be traced. It also is possible to exchange information among entities within the value chain, thus greatly improving customer-provider relationships.

It is important that systems be designed to enhance open and rapid communication and sharing of information across the supply chain and within the organization. Intelligent application of information technology also can eliminate duplicative data entry, provide real-time status information, and help organizations move past a myopic view of their processes to view themselves within the context of larger missions and goals.

See:

—*Defense Inventory: Improved Management Framework Needed to Guide Navy Best Practice Initiatives*. GAO/NSIAD-00-1. October 1999.

—*Defense Logistics: Actions Needed to Enhance Success of Reengineering Initiatives*. GAO/NSIAD-00-89, June 2000.

—“Faster, Better, Cheaper: U.S. Army Manages a Logistics Revolution,” by Rick Eden. *RAND Review*, Spring 2002. Volume 26, No. 1.

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