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Logistics: Supply Based or Distribution Based?

by Eric Peltz

A mantra that we frequently hear is that the Army has moved to a distribution-based logistics system. But what does this mean? If it connotes a target vision that is off base, this could create problems in logistics system design and career development.

For this reason, I have never really liked the distinction made between supply-based systems and distribution-based systems. Such a distinction suggests extreme assumptions and design directions that can cloud our thinking as we strive to design the best possible system for a given situation. Instead, I view the range of possible systems on a continuum. In every case, we should implement the logistics system design that meets customer requirements, including risk considerations, while minimizing total supply-chain cost.

The ideal logistics system for a given situation depends on process capabilities, resource costs, and item, demand, and customer profiles. What is ideal is subject to change—change that is sometimes slow and sometimes quite rapid. As processes improve, the system design should change in an evolutionary manner. For example, faster requisition wait times attained through velocity management (VM) enabled lower reorder points for authorized stockage lists (ASLs), or, in some cases, a higher, more appropriate satisfaction rate within the same storage constraints.

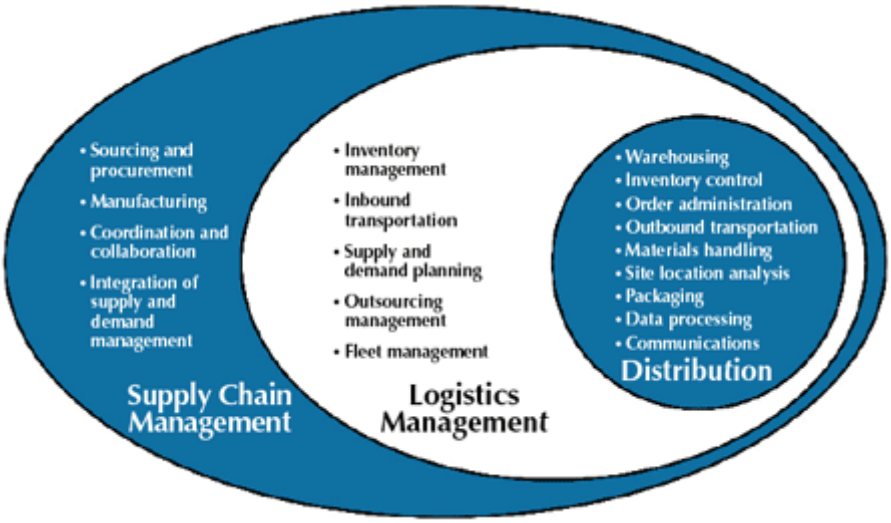
By contrast, the logistics system should change in a more revolutionary manner as process improvements breach thresholds and as new capabilities are developed. This happened, for example, when scheduled truck service in the continental United States (CONUS) began providing deliveries with the same high speed and reliability provided by premium air service while retaining lower truckload costs. It also happened in Operation Iraqi Freedom (OIF), when use of pure pallets enabled direct delivery to widely distributed aerial ports of debarkation in Iraq. Both of these changes significantly reduced distribution times. Similarly, the ideal system design also may change gradually or in large steps as resource costs or potential risks change.

Enthusiasm about the role of distribution in an ideal logistics system is understandable. Long-term trends toward better processes—resulting from the adoption of Lean and VM-like approaches; lower transportation costs in all modes (30 to 60 percent lower from 1965 to 1990, depending on the mode); and information capabilities that have dramatically increased and become less expensive—have led to greater reliance on rapid distribution and dramatically reduced inventory requirements. In fact, business inventories have been reduced 55 percent as a percentage of gross domestic product from 1984 to 2003. However, in most situations, even with these trends, it still continues to make sense to hold inventory at multiple points in the supply chain as part of the ideal logistics system design.

Where demand predictability, volumes, distribution patterns, production horizons, and risk factors support it, maintaining very little inventory—with distribution centers serving primarily as cross-docking operations—is a great approach, but it is not a "one size fits all" situation. ["Cross docking" refers to the process of receiving an item at a distribution center and shipping it out almost immediately without holding it in storage. Maintaining an inventory in a warehouse is virtually eliminated.] More generally, cross-docking activities are integrated with inventory-holding distribution centers (DCs) to break down bulk shipments and consolidate them for movement to their final destinations. A simple example in this context is the cross-docking found in supply support activities (SSAs): An SSA cross-docks deliveries of nonstocked and out-of-stock items, sorting these deliveries and issues from the SSA to provide one set of parts for each maintenance customer. The SSA's response-time advantage remains such that it continues to add value for the SSA to hold in inventory items that drive readiness.

Better response time, if it meets a customer's need, is one major reason to hold inventory at a location. Another potential reason to hold inventory is to enable the utilization of lower cost but slower transportation options while preserving fast response to final customers from the inventory location. But this is advantageous only when the transportation savings outweigh the inventory costs; that advantage depends on such factors as item weight and price, transportation rates, and inventory holding costs. If an inventory location does not produce an advantage in response time, does not lower total supply chain costs, or does not play an analytically supported role in risk mitigation, then it should be considered for elimination.

In the private sector, it seems that recent transportation issues that have created occasional bottlenecks, variability in service, and increased risk are causing a small shift back toward holding inventory. My impression is that increasing customer service expectations also are contributing to this shift. So, too, is offshoring, which creates longer and more variable transportation pipelines. ["Offshoring" is the relocation of business processes to another country.] In other cases, recent rises in transportation costs, combined with associated inventory costs, have interrupted the longer term trend toward reducing inventory and are causing some rethinking of the use of overseas production. This is an example of a threshold being crossed that triggers a change in the supply chain design; higher off-shore labor costs plus higher overseas transportation-induced inventory costs have changed some sourcing location decisions.



This chart illustrates the relationship among distribution, logistics management, and supply chain management. Distribution is a component of logistics management, and logistics management is a component of supply chain management.

Definitions

Distribution is outbound logistics, from the end of the production line to the end user. It includes activities associated with the movement of material, usually finished goods or service parts, from the manufacturer to the customer. These activities encompass the functions of transportation, warehousing, inventory control, material handling, order administration, site and location analysis, industrial packaging, data processing, and the communications network necessary for effective management. Distribution includes all activities related to physical distribution as well as the return of goods to the manufacturer. In many cases, this movement is made through one or more levels of field warehouses. (This definition is from "Supply Chain and Logistics Terms and Glossary," compiled by Kate Vitasek for the Council of Supply Chain Management Professionals. See **www.cscmp.org/Downloads/Re-sources/glossary03.pdf**.)

Logistics management activities typically include inbound and outbound transportation management, fleet management, warehousing, materials handling, order fulfillment, logistics network design, inventory management, supply and demand planning, and management of third-party logistics services providers.

Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service

providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies. (The definitions of logistics management and supply chain management are adapted from those of the Council of Supply Chain Management Professionals. See **www.cscmp.org/Website/AboutCSCMP/Definitions/Definitions.asp**.)

I recently attended the annual Council of Supply Chain Management Professionals conference, and what I heard in presentations there reinforced my sense of a slight trend toward increasing inventory. This seemed to have the most to do, though, with a better general understanding that the overall objective should be achieving a high level of customer service while working to minimize total supply chain cost. My impression is that, in some cases, people have been too fixated on cutting inventory instead of focusing on total supply chain costs and customer service. Now, as their focus shifts to these overall objectives—the real targets—they are not increasing inventory "just in case" but as part of a more carefully calibrated total supply chain approach to meeting customer needs.

Decreasing inventory is the right thing to do when replenishment times become faster and more reliable and when it is done as part of an overall supply chain strategy. But it should not be done as an end in itself. What this discussion of long- and short-term trends illustrates is that we are likely to continue seeing a changing balance over time among logistics system resources, depending on capabilities and conditions. We also should ensure that we consider all approaches and types of resources when developing solutions rather than starting from a limited subset of options.

Implications for Army Logisticians

The continual need for a nuanced and dynamic balancing of distribution and supply in logistics system design has implications for the training and career development of Army logisticians. A logistician's ability to make the right integrated decisions depends on his having broad system knowledge—on being a logistics expert rather than a supply or transportation specialist.

Those engaged in planning the logistics system should understand the tradeoffs among the available resources and system design options. This understanding comes into play at the national level and in setting and evolving a theater structure over time. Logistics system planning will mostly involve field-grade and above officers and civilians in theater staffs and national-level provider organizations as well as in policy and concept, doctrine, and organizational development activities. At these levels, it is important to understand the capabilities and costs of different transportation options and different distribution-channel options, the tradeoffs involved in maintaining inventory depending on item and demand characteristics, and the effects of shipment consolidation options. It also is important to understand synchronization, process management, and how to effectively employ information. Without a good understanding of the full breadth of logistics management and, for some positions, supply chain management, the need to adapt systems as conditions and capabilities change may not be clear or the root causes of problems may not be understood.

The knowledge and skill demands on those whom we might term "battlefield

distribution managers" are quite different from those of logistics system planners. These demands are more oriented toward execution management and more focused on transportation. On the battlefield, the Army needs good distribution network managers who can effectively manage and plan the daily use of transportation, transshipment nodes, and battlefield DCs—managers who are focused on inbound, outbound, and cross-docking execution and on running warehouses more than managing inventory requirements. Doing this well demands that managers understand how to synchronize processes and use information. They also should understand the design of the broader global logistics system in order to integrate their operations effectively with strategic providers. However, at this level, the trend is to have inventory management designed centrally as part of the overall system (for example, the authorized stockage list policy pilot being worked in OIF today), with the personnel in the field more focused on operational management of the warehouse and broader DC activities. We might term the core set of battlefield distribution tasks "physical distribution management." It is about running the DC rather than planning what is in it and where it is, more tactical and operational than strategic.

Thus, as military logistics professionals progress in their careers and begin to play a role in theater- and national-level planning, their knowledge base must expand as they move from more tactical, transportation- and physical distribution-oriented execution management to more strategically oriented logistics-system and supply-chain design and management positions. To be most effective, they need to become adept at integrating the full range of options available to best support units in the field, no matter the situation. Efforts should not be made to minimize inventory to achieve conceptual visions, nor should inventory stockpiles be increased above that which can be analytically justified to meet needs and appropriately protect against risk. Every resource, whether inventory, transportation assets, distribution facilities, or people, should have a clearly defined role designed to meet an objective derived from overall system goals. If these objectives are well understood and used to drive logistics system design, the "right" levels of resources in the "right" places will be employed effectively. Rather than choose between distribution-based and supply-based designs, the Army, in conjunction with its joint supply-chain partners, should seek optimal, balanced logistics system designs that it can adapt quickly to changing conditions.

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