Supply Chain Consolidation…
Using Mechanical Automation as a Material Handling Tool

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A number of corporations find opportunities for savings through supply chain consolidation attractive. Although mergers and acquisitions are often drivers for considering the expense of such radical re-engineering, it's the simple evaluations of standing costs in a current supply chain that drive executives to look at redesigning the processes and operation of their supply chain.

At the 50,000-foot level, manufacturing companies can achieve significant gains by rethinking their approach of holding inventory, normally by developing pull versus push strategies. Unquestionably, at a 25% carrying cost for maintaining inventory, reducing inventory by manufacturing to orders or nearly so is a critical profit opportunity[1].

In developing inventory reduction models, most Logisticians develop trade-offs between warehouse size and their relative service capability, based on a regional model and the efficiency of meeting orders from manufacturing supply. Meeting the demand and getting products to the warehouse or customer in a timely basis involves high-information system efficiency and labor productivity in the distribution and delivery systems.

Most supply chain consolidation models leverage truck and freight costs (combined with carefully designed regional availability) to offset the new, bigger facilities that replace the larger numbers of distribution and warehousing centers found before a consolidation[2]. The savings in functional redundancies and personnel overlap are significant enough, but the ability to make lower inventory service the same number of customer orders is the *real value* in the larger consolidation warehouse approach.

Key to the new supply chain model is the ability to manage service rates and turns much faster. This strategy forces manufacturing to be more responsive and able to deliver products quickly and in the right amounts. Similarly, distribution centers must also be nimble, even though they have often grown in size. In essence, supply chain consolidations allow the company to eliminate days on hand, but they must find abilities to create supply at a rate that meets the demands in their marketplace.

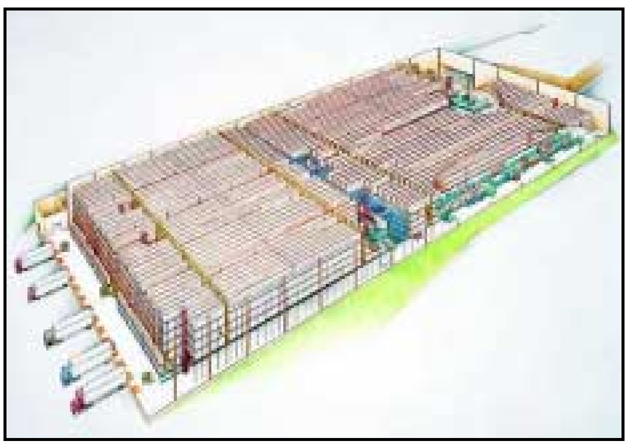
In examining this new supply chain model, the larger but less frequently found warehouse is situated in the national hot spots for distribution centers. Columbus, OH is one example. Columbus is a population center with major, rapidly accessible roadways. Positioning centers in areas like this allow freight efficiencies to optimize costs without jeopardizing the typically smaller (but more frequent) order demands of marketplaces. The downside to this new model is that these modern distribution 'Meccas' rapidly develop competition for labor and land, which escalates the costs of operating these larger distribution centers.

Cross-Docking

It's in this area that mechanical automation for distribution centers begins to make sense. Dependency on labor, in this age of low unemployment runs counter intuitive to good risk management in controlling costs and guaranteeing the 'best-in-class' service. Likewise, investment in bricks and mortar to accomplish larger, well positioned distribution centers seems counter intuitive to good management practice if it's clear the same work can be accomplished with a smaller facility footprint.

So why is it that U.S. corporations continue to justify their automated warehouses and distribution centers in the same way as Europe? By and large, the mixed results history of ASRS (automated storage and retrieval systems) and sophisticated case sortation and delivery systems have left U.S. executives unable to consider such productive and long lasting technical approaches. Capital aversion has remained a major constraint for top managers, as the high visibility of these projects lead Corporate Leaders and Boards of Directors to scrutinize large capital projects with legitimate reservations. A large-scale investment project that fails to meet expectations is surely an albatross around the neck of the manager who champions such a project.

On the flip side of this reasoning is the issue of the benefits such projects bring when they are successful. It's not uncommon for users of ASRS and mechanically automated distribution facilities to repeat a successful installation. In fact, a survey conducted by the membership of the ASRS/AGVS Users Association showed that over 50% of first time users would do it again[3]. Such users cite exceptional reductions in the cost per case and the excellent service capability mechanical automation provides, especially during peak demand periods. In these projects, well-run operations can deliver the lowest cost for 10-20 years, based on lower ratios of labor to results. This can give returns of 15-25% to shareholders who invest in these technical alternatives over a large and rambling distribution center, with benefits extending for many years beyond the initial return.



The reason these facilities are successful stems from two primary factors:

- Mechanically automated storage and retrieval facilities can occupy less square footage and cube, deriving both one-time capital offsets and long-term facility operating savings, particularly in refrigerated and frozen operations.
- Mechanically automated distribution facilities, when well applied and designed, can deliver very high flow rates with tremendous flexibility to meeting order complexities with little advanced warning.

Ultimately, would-be users of these highly productive technologies must have done a good job of determining if, or not, the characteristics of the re-defined supply chain needs these kinds of investments. There are certainly some givens around when such investments are appropriate:

- Overall use of 'best practice' is in place throughout, meaning that investment in the higher technology solution is not a tradeoff for poor process.
- Information technology (IT) is optimized throughout the 'consolidated' supply chain assuring that waste has been driven out by timely and detailed business data.
- Characteristics of the larger manufacturing or pure distribution facility would create a significant headcount, activity, and size of real estate problem, in spite of the best efforts above.

It could be said that such investment in the mechanical automation of distribution operations and other material handling processes is only for the largest, most profitable firms. Certainly, it's the Fortune 500 that is the historical leader in the this kind of investment. Companies such as GM, Ford, 3M, P&G, Kraft, and Frito-Lay are among the many to successfully use mechanical automation for manufacturing work-in-process (WIP), manufacturing distribution, and pure distribution facilities to improve supply chain efficiencies. The heart of any success story is undoubtedly the prudent application of available technologies, coupled with a careful scrutiny of current and projected business requirements. In fact, where mechanically automated distribution systems have fallen short, both buyers and sellers point to the misapplication of technology, flawed requirements analysis and poorly developed expectations.

If U.S. companies are to optimize their potential for return on investment (ROI) in developing supply chain consolidation models, they must seek the technologies already being used in Asia and Europe. As "land, labor, and logistics" continue to seek their optimum return, companies investing in new consolidated supply chain models will need to find ways to isolate themselves from the supply and demand aspects of these 3 'Ls'. Perhaps more importantly, any supply chain consolidation can be negated by simply reapplying existing warehousing technology, leaving the DC infrastructure itself as the slowest, least flexible link in the chain.

1. Warehousing Education & Research Council, "Warehouse Inventory Turnover", Tom Speh, 1999.
2. WERC "Facility Trends, 1997-1999".
3. WERC Watch, March 1999 Chuck Wenzel, independent consultant reported to the ASRS Users Association, 1993.