

Warehousing: The Evolution Continues

By Arnold Maltz, PhD and Nicole DeHoratius, DBA

WERC, as the premier professional organization for the warehousing industry, sponsored a study in 1997 to identify the multiple functions warehouses fill in corporate supply chains. That study, *The Changing Role of Warehousing*, revealed that warehouse operations include activities beyond simple product storage and shipment. Firms rely on their warehouses to coordinate the flow of material and information among multiple supply chain participants and, when necessary, to modify the material.

The pressure on warehouses to be both cost effective and responsive in this coordination/ modification role continues to increase. Advances in information technology drive expectations for total inventory visibility throughout the supply chain. Academics and practitioners emphasize the benefits of an integrated supply chain where the entire channel, from raw material suppliers to the final customer, is managed in partnership. At the same time, supply chains, and consequently warehouses, face increased product proliferation, globalization, and consolidation among retailers and manufacturers resulting in additional complexity.

To assess the impact of these pressures, WERC decided to update the 1997 study. Accordingly, in 2004, Arnold Maltz from Arizona State University and Nicole DeHoratius from the University of Chicago interviewed a number of major warehouse operators and examined published reports on warehousing in the 21st century.

- **Warehousing's Role in the Supply Chain**
- Highlights the unique role the warehouse plays as a resource provider in the supply chain. Retailers operating private warehouses believe the space and labor in these installations are critical to supporting their large retail networks. Similarly, distributors rely on their own warehouses to hold and ship assortments of goods exactly to customer requirements. Manufacturers increasingly source storage, shipping, and labor-intensive, value-added services from third-party warehouse operations.

In all these cases, firms are making location and ownership decisions based on how warehouse resources can contribute to supply chain performance. In turn, these decisions affect the competitive landscape for third party warehouses and require all warehouses to meet high performance goals.

- **Critical Success Factors**
- The critical success factors in warehousing identified by warehousing managers and executives are documented. Establishing clear performance metrics for reliability, flexibility, cost, and responsiveness emerged as prominent success factors contributing to effective warehouse operations. Other keys to success include the

judicious use of technology, training employees, and managing external partnerships.

- **Five-Year Update and Forecast**

Of particular interest is the continuing shift toward viewing warehouses as operations centers rather than storage points. The other trend that has strengthened in the last five years is the tendency to shrink networks. In other areas little progress has been made, specifically in the recognition of warehouses as valuable assets for marketing and knowledge accumulation.

We believe that growth in warehousing will be primarily in and around major population areas, with some shift to lower cost cities nearby.

We also believe that ownership of warehousing assets will rest with two groups. Long-established local and regional operators will keep their buildings, since they are debt-free. Third parties and manufacturers will hedge real estate risk by leasing from REITs and/or other financing agencies. And we believe that overall warehouse performance will continue to improve, but that we will see more specialization of warehouse operations based on product handled, customer, or both.

Executive Summary

Customers continue to expect more from the warehouse, whether firm-owned or operated by a third party. Modern warehouses are expected to handle over 99% of all transactions perfectly and react immediately to special requests. Same day shipment of orders has also become routine in many warehouses. Both customers and warehouse management continue to raise the goals for accuracy, timeliness, flexibility, and responsiveness to customer requests.

Rationalization of Network

The number of firms that fully appreciate the cost of inventory continues to grow. In addition, there has been a surge in merger and acquisition activity among food, consumer packaged good, and chemical manufacturers and distributors in the last five years. Both of these trends contribute to an ongoing rationalization of the U.S. warehouse network, which manifests in the following trends:

- Manufacturers are increasing their use of third-party warehousing to take advantage of third-party resources, i.e., access to cheaper labor and the ability to share space among multiple users. Manufacturers also value the ability to change networks without the burden of fixed expenses. For these warehouse users, space utilization and flexibility should increase while overall costs declines. Interestingly, distributors and retailers do not seem to be increasing their use of third-party warehouses.

- Manufacturers, distributors, and retailers are shifting more activities to the warehouse. Here again the driver is warehouse access to the key resources of space, labor, and knowledge at a reasonable cost. Third-party warehouse companies are very receptive to taking on new responsibilities, since they perceive flexibility as a major part of their offering to customers.
- All users – manufacturers, distributors, and retailers – are shrinking the number of stocking locations in their networks. Smaller networks require less safety stock and are easier to manage. We identified two exceptions to this trend. (1) Retailers and distributors continue to open new facilities to support new territories and (2) warehouses may be opened to handle imports. Users have increased their use of local warehouses as cross-docks to preserve transportation savings on final delivery.
- As networks shrink, warehouse space is becoming concentrated in/near large population centers. Repercussions of this trend include saturated labor markets, higher delivery costs, and increased land costs. Thus there is some warehouse growth in secondary areas that can serve major population centers easily and cost effectively.

Common Characteristics

Successful warehouse operations turn out to have some characteristics in common. They:

- Invest in their people, especially in the selection and training processes.
- Use multiple measures to evaluate the performance of personnel, and these measures reflect both service and cost.
- Implement new technology, both hardware and software, based on anticipated benefits. Right now, the most sought-after benefits are better visibility for planning, better interfaces to customer systems, and better monitoring of individual, shift, and total operation performance.

As warehouses take on more activities, the emphasis on service quality is increasing, slowly changing the absolute primacy of cost in evaluating warehouse performance. However, cost is still the most visible and easiest measure to compile on warehouse operations.

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