

Maximising efficiency in DC operations

Thomas R Cutler analyses the areas in which distribution center (DC) operations can be optimised for maximum efficiency

Dale Hoberman, Director of Supply Chain Solutions for TGW-Ermanco, will present important findings at the 2009 ProMat event, discussing how to maximise efficiency in distribution centre operations. Taking a page out of lean manufacturing concepts, Hoberman defined some basic terms:

Maximise: To make the most of

Efficient: Being productive without waste

Distribution: The process through which commodities reach final consumers.

Hoberman indicated, "We will look at ways to make the most of the distribution processes while being productive, not wasteful." One of the central themes in an effective distribution centre material handling management is how to find the way forward after maximised efficiency is achieved. The Council of Supply Chain Management Professionals (CSCMP) 2008 Fall Glossary has suggested two key measurements:

The Performance Measures (Metrics): Indicators of the work performed and the results achieved in an activity, process or organisational unit. Performance measures should be both non-financial and financial. Performance measures enable periodic comparisons and benchmarking.

Benchmarking (Assessment): The process of comparing performance against the practices of other leading companies for the purpose of improving performance. Companies also benchmark internally by tracking and comparing current performance with past performance.

Challenges facing DCs

According to Hoberman, the top ten challenges currently facing distribution centres are:

- Labour
- DC design
- Quality
- Inventory
- Time
- Space
- Green
- Cost consideration
- Data management
- Technology.

Labour challenges faced by distribution centres

Despite recent reports of high unemployment, finding trained or trainable employees continues to be a challenge. The rising costs of benefits and maintaining full-time employees grow even more difficult, as substantiated by the Bureau of Labor statistics.

Other considerations involved include ergonomic and safety concerns that further add to the challenges of maximising material

handling and distribution centre efficiency. Ergonomic best practices, labour practices, reducing touches and goods-to-associate can all be measured and quantified to improve processes within the distribution centre.

DC layout challenges

There are key layout issues that have a direct impact on efficiency:

- Docking
- Materials handling equipment
- What types
- Design/Flows through the DC
- Future expansions
- Green
- Operating Budgets
- Flexible
- Warehouse control systems (WCS)/Warehouse Management Systems (WMS).

Hoberman suggested, "DC design challenges are met with new customer demands, analysing the scope and objectives of the operation, and the decision when to automate." One of the most obvious ways to measure maximised efficiency is the introduction of materials handling equipment including conveyor systems for storage, sorting, picking and shipping.

The notion of 'Green Material Handling' is not an abstract concept. Green metrics include energy efficiency, product lifetime/lifecycle

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efficiency and a concrete plan for future expansion.

By dealing with a single vendor, the design build of a distribution centre generates increased efficiency through equipment compatibility, implementation, quality, service, and will significantly lower risk (than working with multiple vendors and facing incompatibility challenges).

The final, and perhaps most important metric, is customer satisfaction. The cost to retain a satisfied customer is inestimably less than securing new customers. Hoberman referred to this as the 'Customer Bill of Rights'. It means the customer always receives the:

- Right Part
- Right Place
- Right Time
- Right Quantity
- Right Quality
- Right Cost

Meeting the quality challenges

Quality control and assurance in the distribution centre ensures that a damage-free and complete order arrives on time. According to 'Improving Order Execution Performance: A Holistic View of Metrics across Plant and Warehouse from MESA, OFC, SCE, and WERC 2008', the Perfect Order Index should be calculated as follows:

*Perfect Order Index (POI) .98%
On Time x .99% Complete x .98%
Damage Free x .98% Accurate
Documentation = .931 93.1%*

Handling inventory issues

Inventory challenges include slotting optimisation, limited space issues and accuracy. On January 14, 2009 at the ProMat presentation, Hoberman will discuss the fact that, "Inventory optimisation is managing the trade-off between service levels and cost, specifically the ability to hold constant service

level or increase it while decreasing inventories." Many companies are seeing increased inventories, increased transportation costs and outsourcing. This result in longer lead times and slower, cheaper forms of transportation, which yield more inventory.

Inventory needs to be accurate to plan properly, asserted Hoberman, and cycle counts can cut down on shortages and minimise safety stock. Cycle counts check important stock items periodically throughout the year or month, help identify where errors are occurring and improve inventory accuracy through corrective measures. Material handling and inventory levels can narrate a significant part of the story; holding more inventory than necessary can hide problems in the supply chain, yet holding less inventory can help pinpoint where processes can be improved.

Beyond time and space

Time challenges in distribution centres are significant from the time an order is received to the time it is shipped. Just-in-time (JIT) deliveries are best and require optimised time management. Space challenges are equally difficult from running out of space for stocking a particular merchandise to be shipped, as well as poor utilisation of space or inflexible space. Hoberman suggested, "There are important methods to save space by reducing the amount of obsolete and excess inventory, bringing a change in redundant procedures, physical changes, and change in how inventory is stored."

Indeed obsolete inventory should not be held. It can be sold for scrap, recycled, donated or used for spare parts. Hoberman believes, "Storage is impacted by pallet size, vertical carousels, stacker cranes,

conveyors, and it's best to store slow moving items in temporary structures, outside if possible."

Inside the distribution centre

Inside the distribution centre, energy-efficient MHE and design permit the most efficient and the fastest path; a more efficiently routed system causes less energy and manpower consumption.

According to Hoberman, "Motor-driven rollers or sensors ensure that equipment only operates when necessary. Integrated systems require fewer touches and less energy, less fork lift time, and fewer employees." Other green factors which have an impact include lighting, such as T5HO and T8 lighting. These lightnings can create significant savings over metal halide lamps and have a longer life, which results in savings of 25% to 50% electricity consumption.

Reusable pallets have dramatic savings impact, and according to Dave Madden, President of Container Exchanger, using reusable pallets can generate additional cost savings. Hoberman urged the philosophy of 'reduce, reuse and recycle' packaging of shipping materials.

Reduce the amount that is used, reuse shipping material and improve shipping and packing materials to increase space utilisation. With information and technology, the ability to maximise efficiency within the distribution centre has become both feasible and easily cost-justified. These benefits are economically and environmentally positive and simultaneously create a progressive and dynamic company culture. 🇺🇸

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