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FIVE WAYS TO OPTIMIZE YOUR DC FOR E-COMMERCE FULFILLMENT

Distribution centers (DCs) are experiencing unprecedented growth in stock-keeping units (SKUs) and more inventory turns as a result of demand for e-commerce and multi-channel fulfillment. The impact is predictable. But DCs with traditionally designed material handling equipment (MHE) and warehouse software struggle to keep up.

It's no wonder. The average number of SKUs increased by 18 percent in 2015.[1] This year, 38 percent of companies plan to handle even more SKUs.

While DCs typically are designed to handle below-peak throughput, the rise of e-commerce, more frequent promotions and competitive service-level agreements are creating more peak periods than ever.[3] That increase in demand pushes orders from online customers quickly through warehouses — so fast, in fact, that the average number of annual inventory turns topped nine last year.[4]

E-COMMERCE GROWTH IN THE DC

40%

Percentage of companies serving an e-commerce channel in 2015, up by 6 percent from 2014.[2]

Today's challenge has now become how to manage fast-moving inventory with enough precision to meet the expectations for prompt shipment of multiple small orders. All of these elements have to occur alongside traditional wholesale orders for full cases and pallets. Cost efficiency still matters, but it's become a dual challenge for warehouse design: Businesses must capture e-commerce opportunities — and fulfill them at the lowest cost.[5]

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Here are our top five ways to make sure your DC is optimized for e-commerce fulfillment.

1. Slot Fast Movers and Related Products in Multiple Areas

In traditional warehouse design, high-velocity SKUs are located in one pick zone. It's efficient. As e-commerce orders increase, however, this practice can cause congestion and slow throughput.

In today's marketplace, companies should design to accommodate peaks fueled by e-commerce demands. That means slotting fast-moving products in several pick zones strategically located throughout the DC. Families of products, from which certain SKUs are often ordered together, should be grouped in the same pick zones.

2. Rely on Several Pick Methods to Accommodate a Variety of Orders

In a modern warehouse that processes orders for multiple channels, no one type of MHE can manage the variety or velocity of SKUs. An ideal design includes racks, pick modules, put walls and sorters that are flexible to meet peaks and changing requirements. They can be mobile and controlled by innovative warehouse execution software (WES) that can be reconfigured easily and inexpensively to handle new SKUs, carton sizes and other changing requirements.

MHE Needed for E-commerce Fulfillment

The key to designing a distribution center to efficiently handle e-commerce fulfillment alongside traditional channels is to incorporate flexible equipment that can respond to wave-based and waveless picking. MHE and software need to be reconfigurable on the fly to accommodate ever-changing sizes, shapes, weights and numbers of SKUs.

MHE in an e-commerce DC may include these types of machines:

A-frames are well suited for high-velocity picking of small, uniform SKUs.

~ Pharmaceuticals, for example, are efficiently handled with A-frame equipment that automates picking.

Put-to-light stations identify what products go in each carton.

~ Workers can pack multiple products quickly and sort them correctly in a shipping container while being guided by indicator lights.

Goods-to-person systems bring totes or cartons directly to the picker from dense storage media. This provides access to a large number of SKUs within easy reach of workers at their pick stations.

~ This design also saves workers from spending time walking to retrieve items located elsewhere.

Other MHE can include horizontal and vertical carousels, vertical lift modules, person-to-goods modules, and pick carts with software and lights.

Intermixed carton flow and pallet flow in a pick-to-light module.

Note that having flexible equipment and software is a critical departure from the way most warehouses in the United States have been designed. Warehouses typically batch a large number of orders and process them in one wave. These systems require the orders from subsequent waves to not be picked and/or transported to packing and shipping until all orders from the previous wave are fully processed. Any MHE delay due to missing SKUs and errors could slow or halt fulfillment.

MHE optimized for e-commerce fulfillment makes it possible to change the routing of totes or cartons through the DC. To avoid bottlenecks and delays due to incomplete or incorrect orders, a DC designed for e-commerce fulfillment must be controlled with software that's reconfigurable on the fly. That's a huge challenge. Operations are complex with tens of thousands of SKUs being slotted, picked, sorted and packed to hit tight freight-carrier timelines. Compounding all of that activity of MHE and warehouse workers is the variation in the speed at which equipment operates.

Therefore, pick faces, sorters, conveyors and other equipment that support e-commerce fulfillment should be designed to operate in the following order:

1. **A-frame pick faces need to be located first** in any picking process for fast-moving SKUs. A-frames run faster than other MHE, so it's best to position them to lead off a workflow. Another benefit: Small products don't bounce out of empty cartons or totes like they do when picked after other products have been placed in the containers.

2. **Medium-velocity SKUs should be picked next.** Goods-to-person pick stations should be positioned at this stage, enabling SKUs to be transported from their slot locations and available when picking of the fast movers has been completed.

3. **Slower movers, or orders for many small amounts of a SKU,** should go into carousels at the end of the picking process. Manual picking is also well suited for these orders and can be performed at any stage in the workflow without slowing down other picking as staffing can be flexed as required.

Routing all orders through the same path around the DC creates congestion because of the various speeds of the different MHE and picking operations, as well as varying activity across the pick zones. Cartons or totes containing incomplete or inaccurate orders must complete the full picking route in sequence.

Just the opposite occurs in a DC optimized for e-commerce fulfillment. Conveyors and warehouse execution software, such as the FORTE Smart Warehouse Suite™, can be designed to create alternate routes through the DC. With flexible detours, orders do not have to pass through all of the picking areas — only those from which picks are required. MHE and warehouse software direct cartons to skip picking areas that are backed up or out of products. An optimized system diverts cartons or totes to other picking areas where products are available. Then, the cartons or totes are returned to the skipped picking areas only when products have been replenished or congestion through a pick zone has cleared.

3. Scan to Accurately Pick Split Cases

With e-commerce fulfillment, it's increasingly common for DCs to pick from split cases and marry these multi-SKU requirements with full-case orders for shipping. To accurately and efficiently accomplish these mixed orders, the products and cartons should be scanned to properly identify the contents of each order.

However, many DC operators attempt to save on investment in MHE, especially automated scanning. Instead, they

Scan cartons to identify each order.

> In today's marketplace, companies should design to accommodate peaks fueled by e-commerce demands.

set up an after-sort lane with multiple positions in which workers manually sort the cartons or manually read the SKU information on individual items and cartons. With temporary labor fulfilling peak seasonal orders, and a high turnover of workers many DC operators experience, the odds of errors increase when manually scanning or reading carton information.

Scanning technology connected to advanced WES is needed to confirm that the products from split cases and full cases are correctly consolidated in the same carton or on the correct pallet.

Complete orders exit early on the spiral conveyor to the packing area while incomplete orders continue up to the second floor for additional picking.

4. Allow Early Exits for Completed Orders

It's now common for e-commerce orders to be picked from split cases as single SKUs or small quantities of products, requiring picking from only one or a few pick zones. Most DCs, however, are set up to send the order through the entire picking process instead of routing cartons or totes to shipping once the order is fulfilled.

Not having an "early out" for orders that are picked complete to the shipping sortation area can slow throughput by adding to congestion in other pick areas and delaying shipping times. Instead of allowing a tote or carton to go through all of the DC, design MHE to expedite orders by routing them upon completion from the pick face directly to shipping.

Don't Do This: To reduce shipping costs, pack small items and products from split cases in the same carton. Combine small orders with full cases whenever possible.

5. Pack Efficiently to Reduce Shipping Costs

Companies face pressure from parcel shippers to minimize the total shipping cube at the same time buyers are increasing orders for smaller quantities instead of full cases. Transportation providers now charge by size and not just weight of containers. Combining boxes for shipment by overpacking them or by bundling them can reduce shipping costs.

That's just what a major sporting goods distributor did. The majority of the company's SKUs are picked from split cases. The same order then can include a full case of tennis balls and small quantities of other items such as basketballs, shirts, videos and even coaches' whistles. The company's solution: Slot smaller full cases in the split-case module at the beginning of the conveyor path. When a full case was required to ship alone, it was labeled and placed on the takeaway conveyor. When the case was part of an order with item picks, the case was placed into the shipping carton and items added as the carton progressed through the pick module.

Another alternative to shipping multiple small items is to consolidate all of the small containers into one shipping carton. Rearranging the DC to pick these first and put small-cased items into one carton enables companies to better manage shipping costs. In addition, strapping small cases together as one unit for shipping has been beneficial for some DCs.

Partner with a Warehouse Design and Operations Expert

DC operators must deal with increasing inventory and a variety of SKUs that are larger than ever, due to the rapid shift to e-commerce and other nontraditional channels. The need to fill orders for multiple channels makes warehouse design more important and complex.

Modern design of DCs needs to enable flexibility to handle increasing order throughput, velocity and variety of SKUs, including machinery that bypasses unnecessary pick processes to minimize congestion and expedite shipping.

Meeting e-commerce demands can be achieved cost-effectively by partnering with a design provider experienced at optimizing distribution centers for the world's fastest growing brands. Contact FORTE, which has a team of engineers and warehouse operations experts available to help you improve your DC's e-commerce fulfillment.

Sources
[1]Roberto Michel, "Warehouse/DC Management: Six best practices for better inventory management," Logistics Management, February 1, 2016.
[2]Ibid.
[3]Bob Trebilcock, "5 Ways to Handle Distribution Center Peak Demand," Supply Chain 24/7, July 15, 2015.
[4]Roberto Michel, "Warehouse/DC Management: Six best practices for better inventory management," Logistics Management, February 1, 2016.
[5]Ibid.

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