WHITE PAPER

Extending the Life and Productivity of your Distribution Center



FORTE

Make Distribution Your FORTE

Extending the Life and Productivity of your Distribution Center

Facing any of these challenges in your distribution center (DC)?

- ***Rolled out e-commerce and struggling?***
- ***Labor cost increases straining margins?***
- ***Orders getting smaller and causing picking problems?***
- ***Rapidly expanding SKU base?***
- ***Returns volumes exploding?***
- ***Service level deteriorating?***

Issues like these are far from unique. While not all companies face each of them, distribution centers around the world have similar challenges. And while the challenges are the same, the causes and potential solutions are particular to each company's DC. In this era of needing to do more with less, it's not always possible or even advisable to build a new DC when these challenges emerge. There are ways to add functionality and efficiency to raise an existing DC to new levels of performance. The key is doing so smartly.

Often, when companies run into issues due to growth or another change in the business, they jump into solutions without performing the proper due diligence to determine the root causes of the issues they're experiencing. Many times companies throw labor at the problem, bring in automation without an overarching strategy, or add technologies without fully understanding what their impact will be on existing processes or other parts of the attempted solution. Transitions in established procedures in a DC are difficult enough — transitions without effective planning can be worse than the initial issues they were meant to address.

Companies must completely quantify and understand why there's a need to change. What's the underlying issue or issues that are driving the pain being experienced? Only then can you confidently say, "Here's the problem; here's what it's doing to us operationally; here's what we can do to fix it; and here's what it will get us in the long run."

What's more, many times the ideal solution can seem counterintuitive. For example, increasing inventory levels at one company in the current era of lean might make perfect sense, while in another company, widening aisles for improved traffic flow instead of moving to a narrow-aisle solution might be optimal. This is where consulting experts in DC optimization and design become critical. This paper explores the many common and often interrelated issues distribution operations face today as well as addresses solutions to regain productivity and deliver new levels of efficiency while effectively handling growth inside an existing DC.

Lack of Dock Space and Receiving Issues

Clutter and disorganization on the receiving dock cause ripple effects throughout the rest of the DC. If inventory doesn't flow smartly into the facility, how can it flow out smartly? The upside is that proper receiving processes can ameliorate other issues down the line.

Even though it's a given that shipments are scheduled to most effectively move packages out of the DC, it's common for companies to overlook scheduling deliveries on the receiving side of the operation. Without properly scheduling receipts, multiple trucks can arrive at one time, overwhelming dock space and straining resources, and then there's nothing for hours, where workers and trucks sit idle. Scheduling receipts appropriately over the course of the day enables you to do more with less, helping with efficient use of both labor and dock space.

Another way to optimize receiving is to require advanced shipping notices (ASNs) with pallet-level detail to allow put away prior to completely processing loads into the system. Letting operators receive, check and put away one pallet at a time instead of unloading the entire load to count against a master list, an ASN on each pallet's contents can have dramatic effects on the flow of material through the dock space and into the DC.

When there are a number of vendors with solid track records for performance such that there's a sufficient level of confidence in their deliveries, moving orders through prior to complete order processing eliminates a significant amount of staging. If vendors are often problematic, or for new, unproven vendors, staging can still be employed until they too can be moved directly into the DC. This strategy is very effective in companies with long-standing vendor relationships where the level of confidence is already established. It requires tracking of the pallets as the load is moved into the DC, in case there is an issue once the full load is processed, but the advantages when the loads have no problems are worth the additional process caused by the exceptions.

Given that receiving is dealing with items coming off the trucks and staged one or two pallets high, it follows that there's not usually a considerable clear height required in the receiving area. While the rest of the facility may have conveyors, racking, vertical carousels and similarly tall equipment, as long as lift trucks can move efficiently, receiving isn't a vertical operation. In order to most effectively use the cube, adding a mezzanine over the dock area for non-receiving activities that also don't require significant clear height can effectively repurpose most or all of the dock area.

Potential uses for a mezzanine over receiving are noted below:

- ***Adding a put-to-store system for retail fulfillment***
- ***Creating a tape-and-seal station for outbound over-pack cartons***
- ***Locating value-added services outside of the standard pack/ship process***

Insufficient Storage Capacity

Effects from receiving can be felt throughout the DC, but the most significant impact is running out of storage capacity. No matter how good your receiving and shipping processes run, if your inventory can't be stored and retrieved efficiently, you're facing a continual uphill battle. Often, the issue is the level of efficiency in using the available space and not an actual lack of storage space itself.

Processes that deal only with moving inventory in and empty pallets out are destined for high levels of storage inefficiency. Consolidating inventory from partially filled pallets to a single pallet is key to ensuring that inventory is stored as densely as feasible, opening up new locations as soon as possible. This approach also keeps locations full of product, minimizing the likelihood of a picker having insufficient product for a pick or replenishment move.

Similar to the inefficiency created with multiple partial pallets of one product, when a SKU doesn't require storage of a full pallet, it need not be stored in a full-pallet location. Sizing the location to fit the product, half- and quarter-pallet locations should be created where possible. Where five full pallets were stored, seven or eight half-pallets can fit. Taking it a step further, with particularly slow movers, configuring locations for single cases can be the answer.

Consolidating inventory and sizing storage locations properly are ways to make the most efficient use of existing racking. However, in situations where there's truly a lack of storage space, an option is to move to narrow or very narrow aisle storage. Providing additional capacity in the same amount of space, these storage schemes maximize the use of the cube, but require a significant investment in new racking and equipment to enable put away, retrieval and staging product for picking. Nevertheless, with the right type of product and throughput, it can provide significant levels of additional storage inside the same DC, potentially preventing a move to an entirely new facility and saving money in the long term.

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As a last resort for space-limited DCs, outside storage options can be explored. Excess inventory of slow and medium movers can be moved outside the DC, or products that can be picked and shipped directly from the outside storage location can be relocated to open up space for other SKUs while having a minimal impact on operations and avoiding the cost of transfers to the main DC.

Increased Congestion

When operations begin to run inefficiently due to one or multiple challenges, a likely outcome is traffic congestion in various critical locations in the DC. This situation is particularly true when the root cause of the underlying issues is not investigated and remedied, and then labor is added to try to fix the problem. Choke points become quickly apparent, as too many people and pieces of equipment need to move through the same area or areas.

Fortunately, a host of strategies can be employed to remedy congestion issues, the simplest of which is to add shifts. If the work is spread out over a larger part of the day and with no additional changes to the layout of the DC, the same volume of traffic from the same number of workers can happen in the same allocation of man-hours. Combined with other strategies, like scheduling receipts throughout the day, adding a shift can also help in areas outside of traffic flow and prepare the DC to better handle additional growth.

Just as a problematic highway interchange might be redesigned to alleviate traffic jams, changing traffic flows and redesigns of troublesome areas in your DC can similarly improve movement. One-way traffic areas can be an effective means to reroute traffic, eliminating cross-traffic and minimizing issues at pinch points, since multiple people are less likely to be side by side and more easily able to accommodate someone who is moving in their direction. Such rerouting is particularly effective in pick areas, where more stops and movement are required, increasing the likelihood of cross-flow traffic.

Large DCs often have doors to get from one area of the DC to another, which can create a choke point with two-way traffic. If multiple doors are between the two sections, configuring one-way door flows is an excellent option. When there aren't other doors to use, widening a door to form two lanes should be investigated.

Aisles are typically the source of traffic as a company grows. Aisles where 10 people could comfortably and easily work can become seriously problematic when 40 have to occupy that same aisle when volumes increase. When two-way traffic in an aisle is required, depending on the type of equipment in use, a 9-foot aisle can make it difficult or impossible for two people moving pallets to pass each other. Widening the aisle to 11 or 12 feet enables them to easily pass and move to other picks. Clearly, this solution has other implications for the DC and is counter to the NA/VNA strategy, but when traffic problems are isolated in particular aisles or overall space isn't specifically constrained, widening aisles is an attractive option.

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In DCs where large distances exist between various functional areas, the movement of pallets between them can comprise a significant amount of the overall travel time in the operation. In these situations, it can be advantageous to create a transport function where pallets are staged in an area so that multiple pallets can be moved to the next area in one trip with equipment capable of transporting multiple pallets. This solution reduces not only overall trips required but also the number of forklifts and fork trucks in the traffic flow. The trade-off in this solution is that it creates an additional handle for every pallet, but the result can significantly reduce traffic, making the compromise work.

In any DC, it's obvious that a significant portion of the traffic due to picking results from the fast movers. Pareto's Principle states that 80 percent of the order lines are generated by 20 percent of the SKUs. In one of the somewhat counterintuitive solutions to traffic congestion, it can be optimal to strategically spread out these fast movers

for picking. Where many companies think that they need to have fast movers grouped together as closely to packaging and shipping as possible to minimize the distance required to pick them, this puts the majority of the daily traffic into the same area, requiring most orders to be picked from the same place in the DC. By distributing fast movers across different aisles or multiple pick zones in a module — while using the most efficient locations in those aisles or zones — fast movers can be more efficiently picked, improving overall flow.

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For operations where spreading out fast movers makes sense, it's also smart to move to "pick and pass," or zone picking. In this scenario, workers are assigned to a specific zone inside the pick area and conduct all of their picks from that zone into totes that are moved from zone to zone, bypassing zones that do not contain SKUs needed for that order. The travel distance for any specific picker — and hence the time involved in their picks as well — is thereby significantly reduced, helping to alleviate traffic issues. Successful implementation of a zone-picking methodology requires use of warehouse management software (WMS) or warehouse control software (WCS) capable of filtering pick tasks by zone. But in a scenario where zone picking makes sense for a DC, the likelihood is that WMS or WCS is going to be required for other optimizations as well.

Building on the concepts wherein fewer pickers are required to execute the same number of picks, introducing case-pick modules, especially in combination with batch and zone picking, is an additional strategy that results in more efficient traffic flow through a DC.

Case-pick applications typically comprise a single lane of powered conveyor running through a pick module or zone. Most case picking is done in batch mode, with one pass through a zone to pull cases for multiple orders. The cases are placed on the powered conveyor and transported to a sorter, where the cases are sorted to separate lanes for each order. The benefits of reduced traffic and extremely fast pick rates need to be evaluated against the requirement to handle each case a second time to remove it from the sort lane to place it on a pallet.

Increased SKU Base

As companies grow, their SKU base often grows proportionally, meaning that a DC has to deal not only with more product but also potentially new product types and shapes. This situation generally causes once-adequate processes and operations to become strained. With many companies placing little to no priority on distribution operations from a planning and investment perspective, the front office can quickly put the company into a compromised position by committing to increasing SKUs significantly without a sufficient evaluation of the impacts on distribution. Whether your company is already dealing with SKU proliferation or planning for future increases, solid options are available to properly handle increased SKU counts.

Examining your picking location sizing may indicate that the potential exists for using smaller locations for more dense storage of smaller items. As SKU counts increase, so does the average travel distance for a pick line or pick zone, making operations less efficient. If pallet locations are 4 feet wide but there are many products that don't truly require the full pallet width for adequate stocking, using carton flow racks or bin shelves fits many products in the same area originally allocated for one. This solution requires that the reconfigured locations are able to hold sufficient inventory to remain stocked for picking and places the burden on replenishment in order to maintain inventory levels in the smaller locations.

Picking slow movers from reserve, as long as there's a solid plan as to how to batch pick, sort the items to order and consolidate them with the remainder of the order, and adding a mezzanine for picking are good options to deal with increased SKU counts. Walk-back pick modules can also provide additional, more efficient locations for additional SKUs by creating aisles perpendicular to the conveyor line(s) that house items that are picked infrequently; the less frequently a SKU is needed, the farther back in the aisles it can be located. Though the travel required to pick the slow movers is longer, the benefits of adding a much greater number of SKUs into the pick zone outweighs the slight travel increase.

On the more advanced end of the options, moving to a goods-to-person picking system for some or all order picking changes the nature of picking operations considerably, adding significant productivity. The cost of the equipment and integration of warehouse automation software are the trade-offs with shifting to a goods-to-person option, so fully evaluating the myriad goods-to-person systems available and the potential efficiencies gained are the keys to properly selecting and implementing this picking strategy.

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In addition to the impact on picking operations, SKU proliferation also impacts storage in the DC. Similar to evaluating the sizing of picking locations, properly sizing storage locations can result in more density in the cube and therefore more efficient use of space. As SKU counts grow, there's an increased likelihood that the changing product mix will require storage reallocation. If there are items where full pallets aren't being received, there's no reason that they need to occupy a full-pallet location and using smaller storage locations may better use the cube. On the other end of the spectrum, when storage areas become too densely packed, retrieval of items from storage can become a bottleneck for replenishment and cause traffic-flow issues.

Outside storage is also an option that does not require any changes to the existing facility. Are there slow-moving SKUs that could be sufficiently replenished from outside storage? Storage space for faster movers may be freed up with smart use of outside storage. Properly analyzing SKU turnover rates and storage usage metrics are key to properly understanding storage allocations to enable efficient resizing of storage locations or moving SKUs to outside storage.

Smaller Orders

Particularly with the introduction of e-commerce, smaller order sizes can become the norm. For a company previously focused on retail or wholesale fulfillment, this can wreak havoc on established processes intended for much larger orders and can bring picking operations to the breaking point.

With smaller orders, picking multiple orders together in a pick line improves picking efficiency. Software that batches orders together enables a seamless process for systematic handling of multiple orders at a time. Manual processes attempting to do this are doomed to fail as the time it takes to create the batches and execute the resulting picks negates the efficiencies gained in the pick lines.

In situations where a single SKU is often prevalent in a large number of orders, bringing a large number of that SKU to a designated station to be sorted into the component orders can save significant time. This can be done on a per-batch basis, or a quantity sufficient for an entire day can be staged to expedite processing. This solution can be advantageous when sales or specials are routinely run on a given item, at new product introductions or when a giveaway is being done with all orders. When there are a significant number of one-unit orders for that SKU, additional efficiency can be gained with advance preparation of the proper carton for even faster packing and shipping.

Multi-line order put walls, where batch-picked items are sorted into bins that are specific to individual orders, can be used along with a single-SKU sortation station approach to more effectively deal with smaller orders. Rather than trying to pick a number of smaller orders one at a time, software can create batches of orders that can be picked together in one trip along a pick line or through a pick zone. Once picking is complete, put-to-light technology can be deployed to direct highly efficient sorting of the items to individual orders for packing and manifesting. When there are a sufficient number of smaller orders, put walls can dramatically increase the picking productivity while also decreasing traffic flow overall as fewer pick lines are needed to complete a larger number of the small orders.

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Here again, zone routing of picks and goods-to-person picking technologies can be used to regain lost picking productivity due to smaller order sizes. All of the benefits that help in handling an increased SKU base also apply with smaller orders, and the fact that overall picker movements are minimized really helps versus having pickers traversing large distances to pick small orders. Tied to zone routing and goods-to-person picking, voice technologies directing picker activities can deliver both increased productivity and accuracy when smaller order sizes cause issues.

Once smaller orders are picked effectively as part of the overall operation, looking at packing and manifesting throughput becomes the next area of focus for increasing efficiency.

Crossing over from picking to shipping, picking orders to a shipping carton rather than a tote can eliminate a handle

on every item by eliminating the move from a tote to a carton. If cartons are pre-cubed and inducted into a conveyor system, they can travel to each zone for picking, potentially using pick to light for additional speed. Then, shipping becomes a fill-and-seal operation rather than the entire process of boxing, transferring the order as well while eliminating the need for an additional touch. With advanced software that calculates the expected weight of each carton, the weight can be compared automatically as a check of order correctness. Sealing and label applications can also be automated to take most, if not all, manual effort out of the process post-picking.

In many operations, a number of checks can potentially be eliminated if processes are optimized appropriately. The previous example where picking to carton can be checked with weight rather than a manual check against the shipping manifest is one way in which a process step can be eliminated. One of the potential pitfalls of a weight check for order accuracy occurs when there are multiple colors or other characteristics for items of the same weight, two colors of the same shoes, for instance. In these cases, it's possible to avoid picking errors between different versions of the same product by placing the versions in separate pick locations, not near each other. This way, the picker can't mistake one version for the other, since they're not in close proximity.

Increased Return Volumes

On the back end of the DC operation is returns handling. Along with overall growth and, in particular, e-commerce implementation, return volumes understandably increase. While that's a logical consequence of growth, dealing with the returns is often not properly systematized such that the increase in volume can be easily handled. Many companies have little to no process for handling returns. Quickly and properly identifying the condition of the incoming return is key: Items able to be returned to stock as-is, items that can be returned to stock after repackaging, and items that are damaged and therefore useless. Determining the proper action with the returned item or items is the first step to efficient returns handling. If processes don't exist or aren't formalized, a returns department that was getting by previously can become a disorganized mess once return volumes rise through growth in e-commerce business.

In many cases, even when proper processes are in place, returns handling is a significantly or completely manual process. Increasing system capacity and automation for returns handling can eliminate paper forms and manual data entry. Return authorization numbers in a proper system should be used to keep all information related to a return, bringing up all information at any point in the process to keep returns moving smoothly.

Finally, the physical location of the returns processing area should be considered along with the rest of the DC and operational areas. Here again, a mezzanine in an unused part of the cube can be an excellent location for returns processing as there is no clear height needed, freeing valuable floor space for other priority activities.

Bring in the Experts

It should be clear that the list of potential underlying causes for inefficiencies in a DC at a growing company is long and many of the issues are interrelated. In addition, the various possible solutions to combat inefficiencies in one area will have an impact on others. Now consider that implementing any changes has to take place without shutting down the entire distribution operation. You now have a very complex situation to handle.

Companies trying to handle serious operational inefficiencies on their own, without proper data collection and analysis, could end up making the situation worse and waste precious time and capital. Common pitfalls are noted below:

- ***Not properly digging down to the true root causes of the problems at hand negatively affects any efforts at improvements before they begin.***
- ***Not assembling the correct performance metrics to properly evaluate the situation jeopardizes all of the resulting efforts.***
- ***Not truly understanding the implications of one aspect of a proposed solution on the others can lead to new problems.***
- ***Not looking beyond the immediate needs to find solutions that will serve the company into the future causes issues that can put the company back in the same situation much too soon, hampering future growth and costing additional money.***

Consulting with experts can lead to multiple possible options that address current needs while positioning the company for future growth. The key is to recognize the need before things proceed to a point where minor problems spiral out of control. Even for facilities running well, constant vigilance and re-evaluation can find small efficiency gains that, over time, deliver significant ROI and push out more significant investments.

Is it time for you to dig in?

Why FORTE

Single-Source Accountability

Whether we're helping you develop a strategic plan, design and build a distribution facility, or optimize a distribution operation through performance metrics and analytics, FORTE provides a true single point of contact responsible for the complete performance of your distribution network. No finger pointing. No fragmentation of responsibility. No multiple suppliers for technical support. You have performance goals, and it's our job to make sure they're met on an ongoing basis.

Total Objectivity

We don't manufacture equipment. We don't develop WMS software. We don't have commercial arrangements with any suppliers for expected volumes of business. We're simply interested in delivering the most efficient distribution solutions at the lowest total cost. Our client-side service approach means our only allegiance is to our customers. So with every engagement, you know we'll choose the most appropriate level and blend of technologies integrated into an effective operational system.

Expertise

Our team is deeply rooted in the hands-on implementation of distribution center design and warehouse automation. FORTE's engineers and technicians integrate today's best practices in supply chain management and distribution center operations while developing next-generation technologies. As a result, our solutions employ the best combination of practical advice, data-driven analysis and technology-enabled systems. With FORTE, you get:

That's why the world's fastest-growing companies are making distribution their FORTE.