MULTICHANNEL MERCHANT
OPERATIONS SPECIAL REPORT

Finding the Right Warehouse Technology for Your Needs

By **Mike O'Brien**

As your direct-to-customer business continues to grow, you reach a point where the use of manual processes for managing the flow of goods in and out of your distribution center is no longer adequate to meet your needs. Or perhaps you have an existing warehouse management system but find that the legacy technology has become dated and no longer meets your needs. How do you decide which system is best suited for your needs?

Then there's the whole question of purchasing an installed software system, vs. one that is SaaS or cloud-based. This debate has been going on for quite some time in DTC operations, and will likely continue unabated. The answer depends on your particular business goals, requirements and budget, as well as simply what works best for your situation.

The build vs. buy issue is another area of consideration. However, the number of businesses with the internal resources to not only spec out, design and build a system, as well as perform maintenance and upgrades that meet current and future needs, is fairly small.

What are some of the main criteria in deciding if your organization has reached a growth/maturity point where it needs a warehouse system? Typically, companies go through a compelling event that drives such a change. For example, they may have outgrown their warehouse space and moved into a larger facility. At that point, they realize the old way of doing business – for instance, using spreadsheets and hiring more

staff – is no longer sufficient for dealing with growth in an efficient manner.

An organization moving from a 5,000-square-foot distribution center to a 30,000-square-foot one to handle increased volume and new products can very quickly hit a wall in terms of its old manual processes. Now suddenly warehouse technology is needed to help manage how product gets out the door to customers and comes in from vendors.

Labor, productivity and technology are also key decision factors when considering a warehouse system. Look at metrics such as your company's growth curve, the local labor pool and costs, and currently installed technology. In terms of process, are you looking to move from paper-based to an RF or voice picking process? From an order volume standpoint, what is the relationship between revenue and cost per unit in the DC? How can a warehouse system positively impact your freight costs? The answers to these questions will help you determine if it makes sense from an ROI standpoint in terms of reducing the overall cost per unit.

If you're in a tight labor market for DTC like Cincinnati,

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Columbus or Louisville, a new system can make sense in terms of driving increased productivity at a lower cost. However, if relatively cheap labor is available, some companies can get away with throwing more personnel at operational issues – at least temporarily.

Pooja Agarwal, vice president of operations for subscription service Birchbox, said a main criterion for selecting a warehouse system is finding one that can track and tap into all inventory across channels live in one system.

"We need to have visibility into all the orders and their status," she said. "Another big plus is having reporting functionality including inventory visibility, daily inbound and outbound activity, open orders, historical item activity and backorders. Our tech team also has quite a bit of criteria including ease of integration and whether or not there are APIs that can plug into our system."

Labor needs and staffing, the current facility setup and integration with existing technology systems are all important considerations in sourcing a warehouse system, as well as how it will impact overall costs and margins, said Matt Dellos, vice president of fulfillment for Premier Performance Products.

"You need to do an analysis of how the potential features and processes will impact your business, from a cost and margin standpoint," Dellos said. "For instance, if your current WMS has dynamic slotting, you can have multiple SKUs in a single slot, but without direct putaway, receivers will put product wherever they can find space. Your analysis needs to determine if there will be enough of an uptick in productivity by adding a system with direct putaway to justify the additional cost."

Dellos said the analysis should break down every aspect of the business, not just in the DC, but how a new system would impact procurement, sales, and especially end customers from a fulfillment and delivery standpoint.

WMS, WCS and WES

A WMS stores and maintains a vast amount of information, including inventory data and customer orders and handles non-automated functions. It processes this data to determine things like daily associate workloads and order processing.

Warehouse control system (WCS) technology came along in the mid-1990s to bridge the gap between the WMS and the warehouse floor by allocating, balancing and managing tasks executed by material handling equipment and systems in real time.

The WMS was primarily designed for batch-based inventory management and control within the four walls of a DC. WCS grew up organically on the automation side, handling real-time control of high-speed automated equipment like conveyors and shuttles. The WCS takes order-related information from the WMS, creating waves and sub-waves in the order well to get carved up and sent to the appropriate areas to be fulfilled and shipped.

Over time, the role of the WCS has expanded to encompass traditional WMS functions like inventory management, replenishing, slotting and receiving, while WMS systems are taking on some WCS tasks, so the lines are beginning to blur. On top of that, warehouse execution systems (WES) have come on the scene as a hybrid that includes functionality of both WMS and WCS.

A WES adds business process logic to WCS data. Because it's tightly integrated with automated systems like conveyors, sortation and pick-to-light, it has near real-time visibility into DC bottleneck issues. WES also tends to be more modular than WCS, with components that include WMS, conveyor control, analytics and reporting, and integration functions.

Kevin Thompson, distribution systems manager for Cabela's, said it's a matter of philosophy in terms of using a WMS or a WCS as the primary logic controller of DC operations. In his system stack, he said, a WMS sits on top and the material handling technology on the bottom, with the WCS in the middle.

"You could have your WCS do all of the pick/pack/ship logic, sending items to be sorted and packaged," Thompson said. "When packaging is completed, the information on each item is sent to shipping to deter-

mine where it goes. In that scenario, all the information goes from the WMS to the WCS, and you don't hear anything more about it until it goes out the door."

Thompson said he prefers using a WMS as the primary logic tool because it allows him to catch a package and re-route it before it goes out the door if necessary. "If the WCS were in charge, we wouldn't have a chance to do that," he said.

"Some WCS implementations get very heavy, and take over a lot of the processes in the building, but we're different from that perspective," he said. "We like to put more logic into the WMS, and for that reason our WCS has been getting thinner over the past four years." Thompson added that he didn't agree with the prevailing logic that the capabilities of a WMS had to end at the DC, saying they can be expanded to the broader distribution network.

Pros and Cons of Cloud vs. On-Premise Software

The differences between hosted or cloud-based and the traditional on-premise installed warehouse systems have been diminished significantly in terms of performance. For larger enterprises with budget enough to invest in an on-premise installed system with staff to support it, the promise of cloud may be diminished. But for mid-market companies, the advantage of going to cloud storage and hosting can be significant. Cloud-based systems are designed to scale up quickly and easily.

Implementation and configuration can also be done much more quickly in a cloud environment vs. on premise. A configuration layer allows this process to be compressed, so companies can adapt the system to deploy different methods of picking, putaway or cycle counting. Time normally allocated to configuration and implementation can be reallocated to things like training, allow faster deployment and preparation of staff users.

Companies need to weigh a larger upfront cost followed by maintenance fees (installed) against transaction and subscription costs (cloud). System redundancies are another important part of the equation, as costs can vary between having the redundancy on site vs. what the cloud hosting company offers. Another consideration is the cost of staff to maintain an installed system vs. the cost of subscription fees that cover offsite maintenance.

In considering cloud vs. on-premise systems, do an evaluation of the total cost of ownership for 1 to 5 years out, advises Curt Barry of F. Curtis Barry & Co. Over time, cloud-based systems can start costing more than on-premise installation. However, the IT is no longer being supported internally. Many companies feel the additional cost for cloud at that point is justified in order to continually receive updates and releases from dozens to even hundreds of times per year. Also, the responsibility for up time, systems environment and change of the network is the cloud provider's as the business grows and changes.

Key Integration Points

Two of the primary integration points for a warehouse system are enterprise resource planning (ERP) – which tracks inventory enterprise wide – and order management system (OMS) software. Other main systems that link to and "write" in and out of a warehouse system include forecasting tools, transportation management, shipping and manifesting systems, labor management and customer relationship management (CRM) systems. Many modern enterprise systems include modules with related functions like labor management, transportation and yard management and even order management.

Typically, a warehouse system focuses on the execution layer where product is received into inventory, either at a distribution or fulfillment center. Increasingly these days, it's also tracking store-based inventory through the ERP when companies execute omnichannel tactics like ship from store or ship to store. The system keeps track of physical product locations and the inbound and outbound flow of goods, helping management optimize fulfillment and labor, especially in pick/pack/ship processes.

In a hosted environment, integrating to systems like an ERP or OMS can be easier and faster using web-based APIs. As long as there is in-house expertise on mapping systems, developing web APIs is fairly straightforward.

Build vs. Buy

Building your own warehouse system or systems is another option, but it's not for the faint of heart. It requires a great deal of in-house expertise, not only

for the initial build but also for ongoing maintenance, upgrades and modifications as conditions change. The internal staff also needs to be current with warehousing best practices.

Will it be more productive for you to have an in-house server system, handling your own maintenance and customization? Integration with existing systems is also critical and a potentially large cost area. Dellos recommends running the ROI on a build scenario based on how long you anticipate having the system, factoring in full-time staff and resource costs vs. the subscription, maintenance and customization fees associated with a vendor system.

Barry said the build process could make sense given the right set of circumstances, like creative gift seller Uncommon Goods, which talked about its warehouse system development process at Operations Summit 2016. However, for many companies the time to develop and implement high-function systems is not realistic.

"Large WMS software providers have hundreds of developers, and even smaller ones have dozens," Barry said. "I would ask, can you really compete internally with those resources? I'm a big believer that the user community of a WMS company is the most valuable asset they have to drive the development of all sorts of new functions, pushing them to stay technically current."

Where Things Are Headed

Expect to see more convergence of WMS, WCS and WES, as those lines continue to blur. Also, major ERP and technology companies like Oracle, IBM, SAP and Honeywell will continue to invest in building and acquiring operations and fulfillment technology capabilities, as the volume of ecommerce and direct-to-customer orders continues to grow.

The "consumerization" of technology will also play a role. For instance, the ubiquity and relatively inexpensive nature of smartphones, as well as technology advances in warehouse scanning and tracking systems, means the growing use of simpler-to-use and less expensive handheld devices. Systems will also become more user-friendly for end users, especially the next generation of DC workers.

Related to this is the continuing development of warehouse hardware and software systems to support end-to-end inventory and order visibility, tracking and reporting, driven by consumer demand for accurate, real-time order and product information.

As WES systems are described above, modularity will also be a growing trend as ecommerce and direct-to-customer merchants demand a more à la carte approach to their warehouse technology suite.

"Companies want to decide which pieces to leverage based on how their business operates," Agarwal said. "There won't be one-stop shops as there isn't one way of doing DTC anymore. I think it's definitely starting to move that way, which is why homegrown is becoming more a part of the conversation. In the past, not many people would consider it as an option because of the work and investment, but companies are looking to mold their system to what they're doing."