



June 2011

Warehouses Go High Tech

by Mary Shacklett

As the warehouse emerges as a more direct link in the customer fulfillment chain, new technologies have likewise emerged that promise not only to speed fulfillment but to reduce the costs in doing so. An effective WMS (warehouse management system) remains part of this equation, but so, too, are new technologies that can deliver greater efficiencies to the warehouse. Among these are mobile technology and mobile device convergence, voice-activated operations, automation, green technology and the ability to reconstruct workflows on demand.

Current challenges

If there's a single change agent that has transformed the warehouse over the past ten years, it would likely be e-commerce. With e-commerce, the customer's expectation for order fulfillment is immediate—with an additional expectation that the order will be right. In many cases, this has meant front-facing the warehouse directly with the customer via direct shipments. In other cases, it has meant more immediate interactions with end retailers that are dealing with their customers.

All of this has added up to needs to shorten warehouse pick and fill cycles, maximizing inventory so that only items that are moving into orders are stocked, and offering customers and retailers immediate visibility of everything that is transpiring in the warehouse. Unsurprisingly, these become "tall orders" when it comes to trying to deal with them via legacy WMS and other labor-intensive technologies.

"It used to be that product was stored for longer periods in warehouses, but now the warehouse is being asked to do more," says Mike Markham, Vice President of Sales at Cadre Technologies (www.cadretch.com), which provides warehouse management solutions. "Order fulfillment in areas like e-commerce must be immediate. To achieve this, warehouses have to share real time integration and visibility with their retailer customers. These customers want to be able to query a database and see product availability at any time."

Retailers and manufacturers also want to be competitive in their markets. "They want the flexibility to pursue more opportunities at the same time that they want to reduce the life cycles of their inventories," says Marc Levin, Senior Vice President of Client Solutions for Weber Logistics (www.weberlogistics.com), which provides warehousing, distribution, transportation and 3PL solutions. "In doing this, they want quicker time to market, less inventory to carry, and smaller warehouse building footprints. They also want to run just in time (JIT) operations with inventory at multiple locations that are close to their customers."

Speed, accuracy and integration are major concerns for many warehouses as they are being asked to do more by their customers: "An issue we hear frequently about from our customers is that they have an outdated WMS system," adds Cary Cameron, Senior Vice President at GENCO ATC (www.gencoatc.com), a 3PL provider. "Many companies are using old, legacy, homegrown systems and few resources with the knowledge to perform the integrations with newer technology. Therefore, they just keep these systems running, and IT is perceived as the bottleneck."

The result is often errors in the warehouse on orders that add up to big expenses. "Accuracy is the

number one concern we hear about from warehouse professionals,” says Marceline Absil, Vice President Sales and Marketing, Top-Vox Systems (www.top-vox.com), which manufactures the TopSpeechLydia voice recognition solution. “On a single item pick, the costs of an error can range from \$35 to \$100. This doesn’t help cost containment, let alone cost reduction. A second area of interest is a desire to reduce the quality-check operation and the staff committed to it.”

Technology that is available today can solve most of the pain points standing in the way of warehouses transforming themselves—but there are barriers to getting there, and many of these barriers exist in the mindsets of warehouse decision makers themselves. It’s common knowledge that warehouse technologies are among the last to get funded, and there is resistance to change because people are accustomed to the systems they have used for years. On top of this, you need to make capital investment when you usher in new technology. In some areas of the warehouse, like reverse logistics, the warehouse is already producing big losses—so why invest in it?

“That’s why ongoing education is very important,” emphasizes James Mustarde, Director of Marketing at Twisted Pair Solutions (<http://www.twistedpair.com>), which provides software-based communications convergence solutions. “It didn’t take long, for example, for people to realize that they could use a smart phone for GPS (geographic positioning system) purposes. Immediately, they saw the benefit, and they adopted the practice. In the warehouse, then, it becomes a question of what will it take to ‘move the needle’ so that companies see the benefit in changing what they do? To succeed, you have to find someone in the organization who is committed and who has the authority to move the warehouse forward. That means also being able to show hard numbers to decision makers on when they will recoup their ROI (return on investment).”

Technologies offer headache relief

Despite the customary trepidation, many warehouses are seizing the opportunity to solve age-old problems in inventory management, order fulfillment, labor and floor space waste and accuracy. They are doing it with the help of new technology that offers automation, integration, operational visibility and business intelligence.

One area of new technology is communications convergence that goes beyond the simple voice-data convergence that was tackled ten years ago with the flexibility provided by new software-based platforms that unify all communications across all networks and devices, such as on a single smart phone.

“Communications convergence is a major technology opportunity that warehouses along with store operations, have not yet fully capitalized on,” believes Mustarde. “Let’s say, for instance, that I walk into a retail outlet, and guys are walking around with small radios so they can communicate with each other. The natural question is, ‘Why do I have 50-year-old radio technology doing something that can just as easily be done on one device, like an Android smart phone?’ The smart phone with its data capabilities allows the person on the floor to interface with IT systems at the same time that this person is speaking to someone sitting at a desk in the warehouse. Everything is integrated on one device, and immediate efficiencies are obtained. The real question should be, ‘How do I remove communication device incompatibility as a barrier to my business operations?’ The answer is to make everything come together on a single, multi-purpose device, known as a smart phone, and to let the software this device is capable of running perform the communications and systems integration.”

At first glance, the price of entry into a technology like this might be perceived as purchasing a specific number of smart phones—but the real beauty of this and other new and incoming technologies is that the primary driver is software, which is easy to enhance for obsolescence avoidance, and easier to deploy, since software implementations allow companies to move forward in phased implementations of technology that can be run in parallel with older technology until the company is completely comfortable with the new solution. A phased implementation also allows for phase-in of capital investments on the financial side.

A second technology that is making an impact in the warehouse is voice-activated picking, which uses

devices but is also primarily software-based. The technology is designed to improve warehouse picking operations from the performance improvements that were first realized years ago when RF (radio frequency) devices were adopted.

“When RF devices came on the scene, companies saw a 16 to 20 percent productivity gain in the warehouse from the automation,” says Top-Vox Systems’ Absil. “But with RF technology, you still have to take your eyes off the items you are checking so you can punch in the appropriate information. A logical next step is the migration to voice-activated inventory systems, where you don’t have to take your eyes off the inventory, and you are less likely to make an error. We estimate that this can improve productivity an additional 21 to 25 percent.”

The voice-activated technology works on each warehouse process one step at a time. This eases the transition for older warehouse workers who are used to paper-based picking and processes. It first requests information about the operator. Then, it proceeds to information on the pick, such as “Go to location 123.” Once the operator gets through this, he confirms the location by way of a check digit or a UPC label he repeats. At that point, the location is confirmed. The operator then states the pick quantity, and that amount is confirmed. The process takes the responsibility for accuracy away from the worker, and it also reduces the chance for error—an area where warehouses often lose money.

At the same time that new technologies have come on the scene for mobile communications, there is also transformation in warehouse management systems. Newer WMSs are modularized and rendered fully integratable with virtually every warehouse customer system to promote both seamlessness of operations and 360-degree visibility of warehouse operations for all stakeholders. For the warehouse, there are additional gains, because these universal interfaces allow warehouses to onboard new customers quickly and painlessly.

“We run a modular WMS that is fully integratable with our customers’ systems, whether they are running SAP, Oracle, JD Edwards, or some other solution,” says Weber Logistics’ Levin. “We implement most of our customers with our warehouse within two to four weeks because of these standard interfaces that we have available for a plethora of systems and EDI (electronic data interchange) networks. The biggest thing for us in the warehouse is to afford our customers total visibility of everything that is going on within the warehouse’s four walls. This means that the customer can securely sign into our WMS through a Web portal, and immediately see what’s available by SKU. Within the warehouse itself, we use computer-directed workflows that take out circuitous miles, we operate in an RF (radio frequency) environment—and we achieve inventory accuracy to 99.99 percent.”

Going forward, warehouses will also have a wider range of choice for WMS—whether they choose to host their system internally or to use the services of outside cloud providers with WMS and logistics expertise.

Whatever the choice, corporate IT operations supporting the warehouse can rest easier because they no longer have to wrestle with complicated technology integrations. In a significant turnaround, most technology vendors themselves are assuming responsibility for integration, which reduces the pressure on IT.

“We provide a standard interface for ease of integration,” explains Top-Vox Systems’ Absil. “You can have JDBC (Java database connectivity) or ODBC (open database connectivity) solutions and interfaces. It depends on whether you want real time or offline solutions. The normal situation in the warehouse is that you have batch or single picks to make. We review the process with each customer and also the integration requirements with the customer’s database. Often, integration can be as easy as a field exchange. In other cases, the integration effort is more extensive. In either case, we do most of the integration work, teaming with the customer when it comes time to test these interfaces with the end users, or over a VPN (virtual private network). The end-to-end time for the site survey, programming, testing, train the trainer and cutover typically runs from eight to ten weeks.”

Cadre Technologies’ Markham agreed. “When we work with customers, we take ownership of the integration by incorporating Web services and mapping tools to make this happen. “We also deploy a

cloud-based tool that integrates all systems into a single data repository regardless of the data source. This will allow a manufacturer to have end to end visibility of its supply chain.”

The final result is end-to-end integration of the warehouse with its customers, and economized warehouse operations that save time and money. Just as critical is the business intelligence of warehouse operations that get delivered via “dashboards” using graphical user interfaces (GUIs) that provide instantaneous visibility into warehouse operations for every stakeholder, along with the means for warehouse decision makers to define business rules in warehouse processing and workflows for specific customers or orders.

Getting the payoff

Nevertheless, where the rubber meets the road for most new warehouse technologies is in the CFO’s office. “Every customer we meet with has ROI goals,” says Cadre Technologies’ Markham. “This is especially true with 3PLs and 4PLS, because margins are very thin and they are also looking for greater efficiencies. From a manufacturing perspective, you want to reduce inventories and carrying costs. From a warehouse perspective, you want a payoff of your investment inside of 18 months.” In other cases, technology providers are saying that they are being asked to provide an ROI inside of one year, which is extremely aggressive.

“There are different ways today to assess new technology,” says Twisted Pair’s Mustarde. “One example is the cloud. In cloud computing, someone else owns the hardware and the software, and then sells back the service either as a flat monthly fee or with flexible pay-as-you-go, on-demand terms. The traditional approach is own the hardware and software yourself and provision and provide it as needed, but this is becoming less attractive in today’s tight capital environments where most customers shy away from technology investments that take longer than two years to recoup. Regardless of how they end up paying for new technology, today’s decision makers look for hard dollar cost savings rather than loose concepts.”

Increasingly, it is technology providers that are being asked to supply the ROI formulas so companies can plug in their numbers and determine whether the technology investment pays back fast enough. Sometimes this is easier said than done, especially with small- and mid-sized companies that don’t always have a history of metrics that can tell them how many picks an hour they have been averaging, or what their degree of accuracy in warehouse picks is. This forces technology providers to become creative—in some cases, even offering loan and lease options.

Where do we go from here?

Whether warehouses elect a more paced or a more aggressive adoption strategy for new technology, the market is changing and demands for accuracy, streamlined operations and reduced waste will grow. The case is so sound for the incorporation of new technologies that few of these technologies, when put to the ROI test, are failing to produce hard and compelling numbers for investment. These technologies are laying the groundwork for further technological improvements such as:

- **Operational Interweaving.** “We want to bring multiple warehouse operations into and out of a single order simultaneously,” says Weber Logistics’ Levin. “In other words, if the warehouse is performing a batch pick of an item for several different retailers, each of those retailers is likely to have a different requirement for the pick. We want to be able to address these requirements while we do the batch pick, and not separately, after the pick has been made. Organizing business rules and flowing them into and out of the order at the right times can facilitate this. At the same time, it eliminates the time spent sorting out the batch pick, and then one by one sequentially filling orders based upon the individual retailer requirements.”
- **WANs (wide area networks).** “WANs are evolving that will allow companies to be able to use more bandwidth for video, as well as for voice and graphics,” says Twisted Pair’s Mustarde. “There are increasing numbers of geographical areas that now provide 4G (fourth generation) service to facilitate this, which is great, because when you are in a 4G area with a smart phone, you can access new and

exciting applications such as streaming video.”

- Automated sorters and conveyers with voice activation. “We have been installing automation technologies such as sorters and conveyers in the warehouse, as well as voice technologies for picking and mobile printers on forklifts that eliminate a driver’s need to go back to the office for printing,” says GENCO ATC’s Cameron. “We have also been working on Sky Trax technology over the past four years. It involves the use of optical cameras on forklifts that read the bar codes on the ceiling to obtain locational coordinates in the warehouse, and also the bar codes off pallets. This eliminates the need for operators to work with old fashioned bar code scanners.”
- Automated guided vehicles that will further reduce warehouse labor.
- The use of green technology, such as hydrogen fuel cells for forklifts and other equipment.

Warehouses that are successful in picking the right technologies to modernize their operations will start by finding vendors that can also act as business partners, and that can help the warehouse get to where it wants to be. Part of this business partnership may well be a look at more equipment leasing than warehouses have done in the past. Why? Because equipment life expectancy will become a greater concern, since nothing lasts more than a few months before being outdated with the introduction of new technology.

“Electronics, in particular, changes rapidly,” says GENCO ATC’s Cameron. “This is a real challenge when you are investing, and a reason why more people are looking at equipment lease options.”

One key to getting started is to thoroughly understand your workflows, routing, and physical warehouse layouts first. Once you do this, you can enter into any discussion with a technology vendor understanding where you are and what you want to do. The next step is to develop a roadmap for getting there.

“There are still a lot of companies that don’t want to do anything about their WMS or technologies until their customers force them to do so, but the more strategic companies that have the better survival rates are moving forward,” advises Cadre Technologies’ Markham. “They are asking how they can accommodate their customers, and when they make technology investments, they are looking for ways to leverage those investments across their entire customer bases.” wt

Contributing writer Mary Shacklett is founder and president of Transworld Data based in Olympia, Washington.

Sidebar: Trends on the Real Estate Side of the Business

by Lara L. Sowinski

While changes to the warehouse itself are happening at lightning speed, the industrial and commercial real estate sector has also been seeing a lot of activity.

According to Lance Ryan, vice president of marketing and leasing for Watson Land Company, one of Southern California’s largest industrial real estate developers, the undisputed driver for the industrial warehouse market remains imports coming into the ports of Los Angeles and Long Beach.

“That’s really been the story throughout 2010, which started with companies replenishing stock, and it’s continued as retail consumers started spending again,” explains Ryan. In turn, “We’ve maintained very high demand and a good amount of ‘deal’ activity, in terms of leasing and sales.”

Whether it’s a major 3PL or a multinational company, there are two things they’re looking for in today’s marketplace, says Ryan, “reliability and cost.”

In order to meet their customers' requirements on the reliability front, Watson Land Company has been providing buildings with a greater number of dock doors and larger yards.

"Those are the two key features that customers need to be able to achieve reliability," he says. That means customers can bring all of their containers or trailers in to a facility at the same time for quick processing in order to meet their established time frames."

When it comes to cost, Watson's customers are seeing a big ROI in sustainable buildings.

"Our customers are experiencing a significant decrease in their utility costs—electricity usage is reduced by 50 percent on average," says Ryan. And while that may not represent a huge percentage of a customer's overall warehouse operating costs, "anywhere a customer can cut costs, especially when margins are as thin as they are, it goes to the bottom line."

Sustainable warehouses typically include T5 lighting and good usage of skylights to take advantage of natural light, explains Ryan, in addition to using recycled water and reducing the amount of water that goes into the storm drains.

The feel-good part of sustainability is the environmental component, "but there has to be a cost benefit too," emphasizes Ryan. "It has to hit on more than one cylinder."

According to Ryan, "In order to capture the hearts and minds of corporate America, there has to be a cost benefit, or at the very least it has to be neutral."