Warehouse Management Systems (WMS): At the core of resilience

By working in tandem with other warehouse systems, robotics and automation, WMS has positioned itself as a must-have supply chain application for companies across the board— especially in tackling the labor shortage and adapting to change.

Hotbeds of activity in any business conditions, warehouses have been getting a lot of attention lately. The uptick in e-commerce sales, ongoing supply chain disruptions and the labor shortage are just a few of the forces exerting extra pressure on global warehouses and distribution centers (DCs) right now.

As mainstays of the supply chain, warehouses depend on technology to help them keep their inner workings running smoothly, quickly and efficiently. For many, a warehouse management system (WMS) is command central—that core machinery needed to make that happen.

Software that's placed at the center of supply chain and manufacturing operations, WMS coordinates and optimizes material flows while ensuring that those materials flow through the warehouse in the most efficient possible manner. It manages receiving, inventory, picking and packing, orders and other activities with the overarching goal of monitoring and controlling pretty much everything that happens within a warehouse's four walls on a day-to-day basis.

WMS also provides high levels of inventory visibility, both within the facility and while that inventory is in transit. As Logistics Management reported in 2021, more WMS users began taking a "Cloud-first" approach to buying new or replacing existing solutions last year.

According to Howard Turner, director of supply chain systems at St. Onge Company, that movement is continuing in 2022 as more organizations look to leverage the faster deployment schedules, lower upfront costs, automatic updates and remote availability that Cloud offers.

And the trend is hitting all corners of the software market. According to Gartner, global Cloud spending increased by 23.1% in 2021 to $332.3 billion, up from $270 billion the prior year. By 2024, the research firm expects over 45% of system infrastructure, infrastructure software, application software and business process outsourcing to shift from traditional, on-premises solutions to the Cloud.

"Everyone is pushing to the Cloud," says Turner, who is also hearing from many shippers that they want to better understand the value of this shift before they make this move. One reason is because acquiring software "as a service" is an operational expense (OpEx) versus a capital expense (CapEx). Put simply, a larger upfront investment is effectively replaced with a monthly subscription fee. Turner says companies with longer-term software strategies are rethinking whether they want to "buy" or "rent."

"Some companies still want to better understand the value of moving to a subscription service, and the industry as a whole can be doing a better job of explaining that value," Turner points out. "The IT team gets it, and understands that it doesn't require the hardware, servers or people that it would need to be able to manage on-premises systems."

Other key value points that Turner says Cloud providers could be playing up include the fact that the company is always on the latest version of the software and it can avoid going through the upgrade process.

Solving supply chain challenges in real-time

Under pressure to provide customers with the products they need while also optimizing their [warehouse operations](#), dealing with labor constraints and conserving resources, more logistics managers are asking for supply chain control towers that help them reach these goals.

Connected, personalized dashboards populated with data, business metrics and supply chain-related event information, supply chain control towers help supply chain professionals better track, prioritize and solve challenges in real-time.

"A lot of companies have reached out to us in the past year, asking for help setting up a control tower approach," says Turner, who sees WMS playing an important role in these real-time information hubs. That's because WMS can work in concert with labor management systems (LMS), warehouse control systems (WCS), transportation management systems (TMS) or warehouse automation to create a tightly interconnected control tower setup.

Once in place, that control tower allows logistics managers to manage high levels of complexity and take actionable steps on the fly, versus waiting days or weeks for historical information to be presented to them in a report. In the current, fast-paced supply chain management environment, even a few minutes or dollars saved here and there can add up to substantial "wins" for the company and its customers.

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"Control towers allow integrated systems to feed data into a dashboard or business intelligence system that may pull data from other sources [e.g., social media or a news outlet]," Turner explains, "and serve it up in a digestible format that companies can take action on."

Over the last two years to three years, WMS developers have also been working to integrate their system with [warehouse automation](#) like pick-assist systems and robots. For the latter, Turner says both the latency and integration issues that surfaced during robotics' early days have since been addressed.

That's good news for companies that want to more seamlessly integrate robots into their warehouses at a time when hiring more labor to handle bigger workloads is expensive and often unachievable. "The WMS sector—and particularly the larger vendors—has done a good job of demonstrating how its systems can integrate directly with robotics," says Turner, "which is rapidly becoming a bigger and bigger piece of warehouse operations."

Cracking the nut

As he assesses the current state of warehousing, Clint Reiser, director of supply chain research at ARC Advisory Group, says micro-fulfilment is emerging as a key focus for the grocery sector, which is a big WMS user.

With e-commerce grocery sales projected to reach $1.12 trillion this year (up 11.1% over 2021) and set to reach $1.29 trillion by 2026, according to data from Mercatus, grocers have had to quickly shift and scale their e-grocery offerings to meet that growing demand. And as shoppers

become even more comfortable shopping online, grocers are still adjusting their offerings to meet those changing expectations.

"Grocery is one sector that's definitely driving WMS sales and warehouse automation sales in general right now," says Reiser, who points to AutoStore, Exotec, Autobotics, Ocado and Dematic as some of the top companies currently advancing their grocery-focused warehouse functionalities and micro-fulfilment offerings. He says the biggest users of micro-fulfilment right now are grocers, which face numerous warehousing and fulfilment challenges as they shift their models over to e-commerce and delivery and away from in-store shopping.

"The biggest nut that grocers are trying to crack right now is how to pull together orders rapidly and responsibly at a reasonable cost," says Reiser. "The WMS vendors that will benefit most from this trend are developing solutions that can operate in conjunction with complimentary technology [e.g., distributed order management] and support micro-fulfilment center operations."

Battling long-term labor constraints

Robotics are top of mind for shippers right now, according to Dwight Klappich, VP Analyst, supply chain research at Gartner, Inc., which recently asked companies about their top criteria when evaluating supply chain technology. He says 66% of those firms are concerned about labor availability and need technology that can help them mitigate that problem. Robotics rises to the top during these conversations.

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"In the past, labor constraints were often viewed as temporary or transitory," says Klappich. "Now, nearly every company I speak with sees labor constraints as a long-term issue." These realities have hit warehouses and DCs particularly hard because the work itself can be physically demanding. Even with an automated solution delivering goods to pack stations, an employee may have to be on his or her feet for an entire shift, packing orders.

"Not everyone wants these jobs, and companies can only increase pay rates by so much," Klappich points out. "We're at the point where labor costs have outpaced the rate of inflation because companies are competing for a limited labor pool." Along with infusing more robotics and automation into their operations, companies rely on WMS to support the picking, moving and tracking of goods through their warehouses and DCs.

Most current WMS users are satisfied with these core functionalities, but others are asking vendors how the software can help them address a persistent labor shortage that may not subside anytime soon. Klappich says robotics is helping to fill the void, and particularly for those operations that wouldn't have made the big investment in stationary warehouse fulfilment in the past.

Third-party logistics providers (3PLs), for example, are particularly well positioned to benefit from robotics. "A 3PL wouldn't build a $100 million warehouse with a seven-year payback for a customer that wanted to sign a three-year contract," Klappich explains. "But they can use robotics to spin up the operations that a specific customer needs for that 36-month period."

Helping companies adapt to change

While robotics may offer an immediate solution to the expanding 3PLs' challenges, the actual robotics-WMS connection is still being worked out, at least on a large scale. The company using a robotics platform from one company and collaborative picking robots from another, for example, can use application programming interfaces (APIs) to integrate the two different platforms and get them exchanging the right data with one another.

Already available, these one-to-one integrations may expand to include more equipment and software. "Over the next decade, we believe the majority of companies will have heterogeneous material handling fleets," says Klappich. Those fleets may be made up of Locus order-picking robots, Seegrid's heavy-load self-driving pallet trucks and high-reach lift trucks made by Crown Equipment.

Once underway, this trend will drive a new requirement for software that enables more ubiquitous connections between the robots and the business systems. Klappich sees WMS playing an important role in this continued evolution and tells shippers to place a better emphasis on their software's technical architecture than they might have in the past.

"Most [WMS](#) can handle core functionalities," Klappich adds, "but what's really going to differentiate these applications is their technical architecture and the system capabilities that are being put in place to help companies adapt to change."