MODERN
MATERIALS HANDLING

A Complete Automation Solution

PEERLESS
CONTENT CREATION

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Greater demands, tight resources drive need for **complete automation**

WAREHOUSES TODAY ARE THE LYNCHPIN BETWEEN demanding, connected consumers and suppliers and brands. If distribution centers (DCs) can't fill orders quickly, efficiently, and accurately, companies potentially lose sales and market share. At the same time, DC operators can't just throw more manual labor at the order fulfillment challenge because of today's tight labor market.

These issues can be seen in "MHI's 2018 Annual Industry Report" that found that the top two challenges for those surveyed were "customer demands on the supply chain," followed closely by "hiring qualified workers."

The ability to find enough warehouse labor is becoming a more acute challenge. According to U.S. Labor Department data, employment in e-commerce and warehouse operations nearly doubled between 2001 and 2017, reaching more than 1.4 million jobs at the end of 2017. What's more, the Conference Board recently released an analysis that predicts a "historically tight situation" for blue-collar labor by the close of 2019.

Increasing order fulfillment complexity coupled with inability to easily add labor is a tough situation for DC operators, but can be mitigated, notes Dave Williams, VP of software for Westfalia Technologies, Inc., a leading global provider of warehouse automation solutions. He adds that with the right automation solutions in place and flexible software to execute with, warehouses can serve their crucial role as effective hubs.

"The warehouse often sits in the middle of a relationship between suppliers and end customers," says Williams. "If they can't manage the order fulfillment process quickly and accurately, and their operations aren't efficient, they

become the bottleneck in the supply chain. Conversely, if you have a complete automation solution—one that fits your challenges and has a flexible software foundation to execute fulfillment processes with—a DC operation can be highly effective in its vital role as the hub between consumers and manufacturers."

Order velocity and complexity is changing on both the direct to consumer, e-commerce side and the business-to-business (B2B) front. Online sales require a DC to do much more each picking, which necessitates frequent replenishment of forward pick areas, as well as efficient storage workflows.

At the same time, notes Williams, with B2B distribution, retailers are seeking leaner inventories at the store level, keeping just enough inventories on hand to meet demand. This requires more frequent replenishment orders out to stores. This often translates into more layered/rainbow pallets that need to be built and shipped, rather than more infrequent shipments of full pallets for one stock keeping unit (SKU).

Automation for DCs such as automated storage & retrieval systems (AS/RS) can help address these challenges. For a DC with a heavy e-commerce fulfillment role, an AS/RS can serve as space efficient
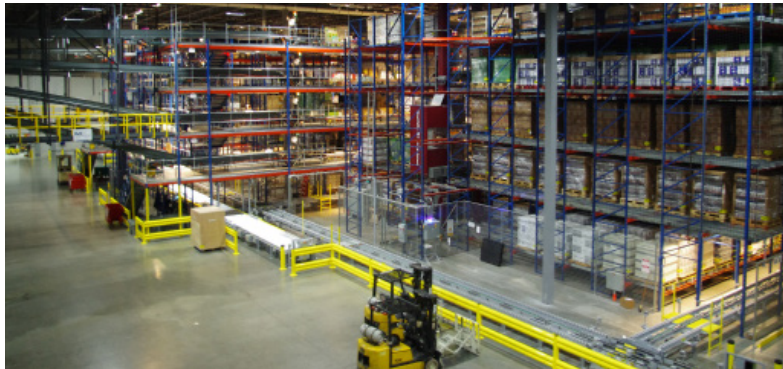

GREATER DEMANDS, TIGHT RESOURCES DRIVE NEED FOR COMPLETE AUTOMATION
The ability to find enough warehouse labor is becoming a more acute challenge

EMPLOYMENT in e-commerce and warehouse operations nearly doubled between **2001** and **2017**

REACHING **1.4 MILLION JOBS** at the end of **2017**

SOURCE: U.S. LABOR DEPARTMENT

storage to replenish e-commerce pick areas that might use technology such as put walls.

For DCs that remain heavily focused on filling B2B orders to retailers or other businesses, a unit-load AS/RS with deep storage can efficiently store, pick and stage orders for shipping to businesses. An example of a "hybrid AS/RS" solution would be an automated layer picker or palletizing solution for increased efficiency in larger workflows.

By installing an AS/RS, companies can address multiple challenges, notes Williams. These include making better use of warehouse space via deep storage. With the rising cost of warehouse space over the last several years, automation can help companies keep up with increasing order volumes without having to build or lease at high cost.

Perhaps most importantly, AS/RS solutions can keep pace with the increasing velocity and complexity of orders which many organizations face, while fulfilling orders accurately, and adhering to inventory management rules.

"In a manual world, your people not only incur an enormous amount of travel or movement when picking and filling orders, they also frequently need to move product out of the way to get to the product they need for an order," Williams says. "Additionally, in a manual environment if people are left to make decisions on which products to pull to fill orders, and they don't have the correct parameters available to them, they will tend to pull the product that makes it easiest to fill the current order, even though that might not be the product that should go next."

AS/RS integrated with a flexible software solution, on the other hand, will always follow the correct inventory management rules in addition to automating retrieval/pick moves so that human labor can focus on other issues. The software makes it possible for a DC to correctly follow advanced rules for storing SKUs that may have expiration dates, or that should be picked with product height, weight or dimensions in mind so that pallet building and outbound shipping is simplified. In fact, warehouse execution system (WES) software is constantly assessing how to best sequence picks and other warehouse activity based on current orders and machine and labor availability.

"In a manual world it can be extremely difficult to follow more complex inventory management and picking rules, especially with the higher order frequency and pace of fulfillment in DCs today," says Williams. "So, the benefits of automation aren't just about automating movements—they extend into software-driven capabilities like being able to follow

> "The benefits of automation aren't just about automating movements—they extend into software-driven **capabilities like being able to follow correct inventory management rules while processing** orders faster and accurately, all while making better use of available square footage."
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> *Westfalia Technologies*

correct inventory management rules while processing orders faster and accurately, all while making better use of available square footage. Of course, the solution must have flexible software to allow all of these benefits to come together."

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The components of a complete automated solution

A **"COMPLETE AUTOMATION SOLUTION"** is one that fits your business and accomplishes your order fulfillment and storage goals. While the industry has tinkered for years with the idea of "lights out" facilities that are completely run by automation, for most distribution centers (DCs) today, people remain a valuable part of the equation—even if more automation is needed to keep up with customer requirements.

In short, think of complete automation as a solution that works with the flow of your business, rather than being an attempt to replace every workflow with smart machines, explains Dave Williams, VP of software for Westfalia Technologies, Inc., a leading global provider of warehouse automation solutions, including software and automated storage and retrieval systems (AS/RS).

"The complete automation concept is about the desire for efficiency," says Williams. "Complete automation may in some cases mean you automate almost everything, but more often, it means you automate the right processes, though not necessarily every process. It also means that after the automation is implemented, you can interact with it through software in a way that makes your process flow more effectively, including the human labor element, to fulfill your order requirements."
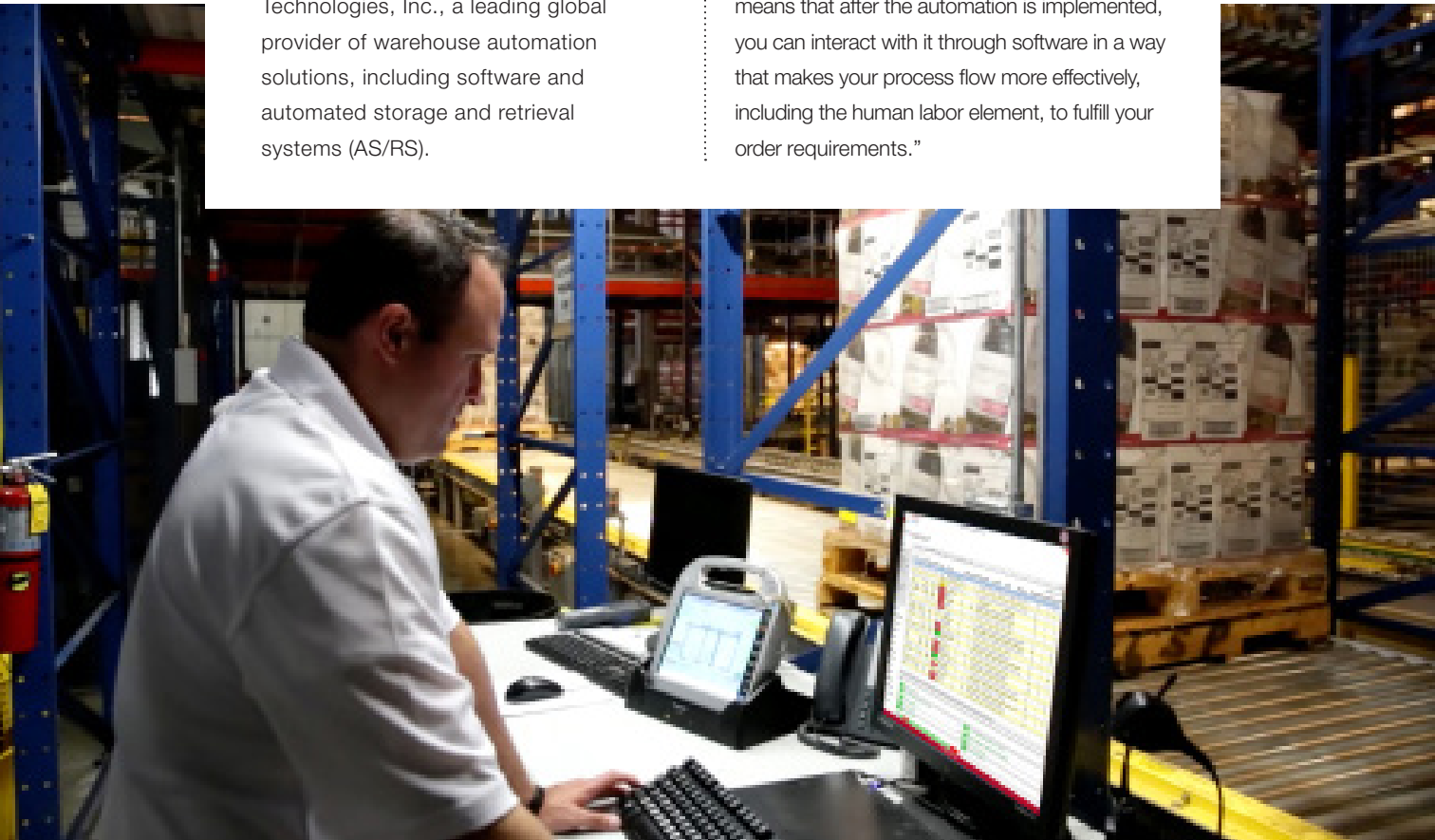
In this view of complete automation, multiple factors come into play. It involves services and scoping to select the right type of automated machinery for a specific facility, and is driven by software that blends warehouse management system (WMS) level functions with warehouse control system (WCS) capabilities.

This type of software, known as a warehouse execution system (WES), when offered by an automation provider, ensures that all resources in the warehouse can work together dynamically to meet complex order requirements, says Williams.

"The software plays a key role in the complete automation

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> *Westfalia Technologies*

approach," says Williams. "Our software, Savanna.NET®, is a WCS, but it also provides crucial warehouse management level functions such as inventory and lot code management, as well as

resource management for directing people from a picking perspective. It offers one system to manage both automated processes and conventional workflows. In terms of complete automation, the software is what makes everything work well together to achieve maximum efficiency while getting your orders filled correctly and on time."

Whereas traditional WCS software is more about governing the exact movements of a piece of automation like a conveyor, a sortation divert or a storage and retrieval machine (S/RM) pick, WES is broader based in that it orchestrates both machine and labor resources, while supporting other warehouse functions like order releasing and pick sequencing, inventory replenishment, labor resource management, and packing/shipping execution.

A WES delivers all this functionality in one software solution, therefore integration burden when deploying is dramatically reduced and/or eliminated. Also, there are far fewer concerns with keeping changes at either the automation or warehouse management levels in sync.

For example, says Williams, if your business needs to change the way lot codes are tracked, and code tracking is adjusted in a WES like Savanna.NET® that

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uses the same data model as the automation, this change is going to be correctly carried out by the way the automation retrieves lots. By contrast, a custom integration between disparate WMS, WCS, and an AS/RS would require careful testing of such a change.

"The key is having a single, solid software platform that can act as a conductor for orchestrating all your warehouse processes," Williams says. "Having that in a single package affords much less risk when it comes to startup, support and training, and also gives you the confidence of knowing that a change in one function of the WES is going to work across all functions."

When combined with a multiple-deep, unit-load AS/RS that stores a variety of SKUs in a high-density configuration, a WES solution allows for productive, flexible retrieval of product. Working in

concert with a WES, multiple-deep storage, that may be as many as 20 pallet positions deep, offers flexibility in terms of being able reconfigure the positions or "lanes" to accommodate different SKUs depending on variables like seasonality. Multiple-deep storage also introduces a level of redundancy in the system in terms of cranes from different sides being able to access the same deep storage positions.

Westfalia's S/RMs can traverse on both a horizontal plane or a vertical plane, allowing for rapid retrieval and movement of goods. It's the software behind the solution, however, that determines the best sequence of S/RM moves to fill orders at hand while adhering to all inventory management rules.

"The efficiencies of an AS/RS are from a density standpoint—from the design and working of the S/RMs—but also due to the software. The software lends both efficiency and flexibility because it will quickly pull products you need from the right locations, exactly when you need them, whereas in a conventional, non-automated world, these products might not be easily accessible."

One aspect of designing the right system for your unique business needs is to look at third-party automation such as layer picking system equipment, palletizing, or other types of automation, that can be be paired with an AS/RS to automate a much larger fulfillment process than just storage and retrieval. Using Savanna.NET's integration layer and control capabilities, third-party automation can work in synchronized fashion with Westfalia automation and with conventional, non-automated workflows managed by the WES.

The Savanna.NET® WES is also is very much an operational system that managers use for resource management, metrics, and visibility into the progress of work in the warehouse, both in automated areas and conventional workflows, says Williams.

"We take a visual approach with our WES solution," says Williams. "We are illuminating the manager's view into the warehouse, so that they can see the progress of work and determine if and where there are any issues developing. Having that type of software-driven visibility into operations is part of what it means to have a complete automated solution."

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Sargento meets **long-term capacity objectives** via warehouse automation

G ROWING CONSUMER DEMAND for natural cheeses and other products from Sargento Foods Inc. was causing the Plymouth, Wisc.-based food manufacturer to begin to run short on space in its existing distribution center (DC). Warehouse automation from Westfalia Technologies, including a high-density automated storage & retrieval system (AS/RS), has solved that concern for Sargento, providing the company with an efficient infrastructure for outbound order fulfillment for years to come.

Sargento, established in 1953, has grown through the quality of its cheese and innovations in pre-sliced cheese, vacuum packaging, re-sealable packaging, and production of shredded cheese and shredded cheese blends. The company also manufactures sauces and snack foods for grocers at the retail level and for corporate clients, such as restaurants and other food manufacturers.

Growth from its sales was making space scarce, so the company began searching for a solution that would enable it to increase DC storage capacity. The team assessed key data to help them to select a solution, including the size of the warehouse, how much space was utilized with the traditional picking system, and how much

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>
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more capacity would be needed to support growth at the current rate. The solution also needed to accommodate the ongoing operations during implementation.

Westfalia collaborated with Sargento's engineering team to develop a streamlined solution that was easy to support, operate and maintain. Together, they looked at various design solutions for the facility using Westfalia's high-density AS/RS and an integrated layer picking system, orchestrated by Westfalia's Savanna.NET® Warehouse Execution System (WES).

"With the warehouse execution system, Westfalia provides a complete solution that automates and controls order handling within the distribution center," says Bruce Wisnefske, director of engineering services, Sargento.

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"Westfalia's automation solution has provided us with the warehouse capacity to sustain our long-term growth."

— Matt Schaub, DC manager, Sargento

Since the project included retrofitting Sargento's current DC, Westfalia installed the system in six phases, allowing the warehouse to maintain operations and meet customer delivery expectations.

"Westfalia's automation solution has provided us with the warehouse capacity to sustain our long-term growth," says Matt Schaub, Sargento's distribution center manager.

The AS/RS and an integrated layer pick system is tailored to the profile of the site, where the output is roughly 30 percent layer picking, and at least another 30% full pallet picks. This integrated solution matches Sargento's capacity objectives. "Combining those two [layer and full pallet pick operations] with the AS/RS and the layer picking system working closely together has really helped the solution work for Sargento," says Schaub.

CHALLENGES

- *Sargento Foods needed to increase the capacity of the distribution services warehouse to keep up with growing demand.*
- *The solution would need to support both layer picking and full pallet picking.*
- *The solution would also need to accommodate the warehouse activities during implementation.*

SOLUTION

- *The company increased storage capacity and storage density with Westfalia's AS/RS and integrated layer picking system.*
- *Westfalia controls the entire warehouse with its warehouse execution system, Savanna.NET®.*

RESULTS

- *Sargento was able to increase the storage density of the warehouse and extend the life of the current DC by up to a decade.*
- *Sargento was able to maintain its distribution activities throughout the implementation.*

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MAKING THE CASE:
Payback Points: Accelerate throughput while solving space & labor concerns

WITH AN UP ECONOMY THE LAST SEVERAL YEARS, booming e-commerce, and more frequent replenishment to traditional channels, the volume of goods that many warehouses ship—and the cycle times they expected to do it within—are becoming more demanding.

Such business growth is good, but can be challenging to support with largely manual methods that require added space and labor to keep pace. The trouble is, after years of a strong economy, industrial real estate is becoming costly, while low unemployment makes additional warehouse labor very difficult to find and retain. That makes expansion of manual storage and picking methods costly from a financial perspective, or unreliable from a human resources perspective.

Automation is the answer, but only if it's a complete solution that offers the best-in-class automation hardware, service expertise and support, as well as a warehouse execution system (WES) software platform to orchestrate all resources. Westfalia Technologies is known for this complete approach to automation including high density, automated storage & retrieval system (AS/RS) solutions.

By implementing an AS/RS driven by WES software, companies can do more with less space. The automation itself reduces the human labor that, under largely manual methods, is spent driving up and down aisles with forklifts to pick or move product.

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One storage and retrieval machine (S/RM) operating on three shifts can typically do the same work as three forklifts and nine employees. This lessens the overall labor burden and makes it possible for DC operators to assign the workers they can find and retain to other tasks like receiving, replenishment, cross docking, packaging, loading or other tasks.

For an operations director or a VP of operations, "complete automation" means your DC can meet demand requirements without escalating labor costs and an ongoing struggle to hit shipment times due to the longer cycle times typically involved with manual processes versus automated ones, notes Dave Williams, VP of software for Westfalia.

Under manual operations, not only do workers expend time travelling to and from a pick location, in some cases, they may have to move pallets to find the correct goods to ship, explains Williams. AS/RS solutions driven by a quality WES reduces the need for this labor because the inventory rules and picking logic in the software mean the S/RM will always be able to quickly access the needed inventory.

A WES solution such as Westfalia's Savanna.NET® supports order picking accuracy and efficiency by tracking which goods need to be picked on first-in, first-out (FIFO) or a first-expired, first-out (FEFO) basis.

"In the AS/RS world, retrieval is done automatically in keeping with inventory rules, so you aren't wasting a person's time digging through inventory to find what you need," says Williams.

Storage and order picking with a high density AS/RS can also be significantly faster than manual workflows.

With Westfalia's AS/RS solution, this speed is partly due to the nature of the S/RMs themselves, which can move horizontally and vertically simultaneously within one aisle to very quickly arrive at the pick lane/storage location. Meanwhile, multi-deep lanes allow for flexibility in storing fast, medium, or slower moving goods. Finally, Savanna.NET® is able to orchestrate the picks and output of an AS/RS with other automated/non-automated processes.

As a result, the automation can process orders more efficiently than traditional manual methods. For example, Heaven Hill Brands, a Kentucky-based distilled spirits producer, was able to ship products 400% faster by automating previously manual processes with a Westfalia AS/RS solution that synchronizes with an automated layer picking system.

For CEOs or other senior executives in a company with DC operations, space utilization is one of the main benefits of automation. AS/RS do away with space consumed by the number of aisles needed in a manual DC. As a result, the move to AS/RS can allow a company to keep up with growth without having to undertake a costly building or expansion project or lease additional warehouse space, explains Dan Labell, president of Westfalia Technologies.

"There's a significant benefit to using an AS/RS when it comes to real estate concerns," says Labell. "Because of the space savings, an existing DC may be able to be reused with the dense storage of an AS/RS and therefore, you

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offset the need to expand."

The other big driver for AS/RS from the C-suite perspective, Labell adds, is lessening the labor challenge that many companies find themselves in. It's not automation to replace readily available workers, he adds, but rather, practically a necessity for companies struggling to secure enough labor. "We're seeing more and more companies just having a huge pain point with labor availability, especially when it comes to busy 24/7 operations who really struggle to fill spots on second and third shift operations."

To be fully effective, automation needs to have WES software coordinating machinery and labor resources in the most flexible way, notes Labell, as well as strong vendor support services, but it's the industry megatrends in real estate costs and labor shortages that makes automation benefits more pronounced today than five or 10 years ago.

"The needs are acute," says Labell. "More company leaders are realizing: 'we have the business volumes from our customers, but we know we have staffing problems where we can't operate adequately with manual processes, and space is getting tight, so without an effective automation solution, we have now a major constraint in our supply chain.'"

Finally, information technology (IT) leaders in the company have fewer integration worries with Savanna.NET®. That's because Westfalia's WES application is a modular, tightly integrated combination of warehouse management system (WMS) and warehouse control system (WCS) functionality that can be used to optimize material flow and order picking for both automated and non-automated processes.

"Having that all in a single package affords less risk when it comes to startup, as well ongoing support and training," says Williams. "It also gives you the confidence of knowing that if you make a change in one function of the application, it's going to work well with all other functions in the solution."

THE AUTOMATION IMPERATIVE:
Complete approach ensures success

INDUSTRY MEGATRENDS ARE ALL BUT FORCING THE MOVE toward more automation for many distribution center (DC) operations. The price of warehouse space is rising, and the labor market is tighter than it's been in decades. That makes the need to automate more pronounced, because many companies just can't keep up by relying on manual operations that require more space and more people to get higher order volumes out the door.

That's why a "complete" approach to automation—one that pairs best in class warehouse automation systems with comprehensive services and a warehouse execution system (WES) software platform—is necessary. In short, more companies need to automate, but they need to do it right.

At first, many warehouse automation choices for storage look similar, impressive machinery such as high-density automated storage and retrieval systems (AS/RS) featuring digitally controlled storage and retrieval machines (S/RMs).

But that's only part of the complete picture. Success also hinges on how well the automation solution is configured to suit your DC operations, both today and into the foreseeable future.

Also, just as importantly, ensuring that the solution provider offers a software solution that can synchronize all of your resources—both for automation and conventional operations is key. Finally, does the automation provider possess the strengths to keep everything running smoothly?

Consider these crucial elements involved in a complete, effective automation solution:

The best available automation: Westfalia's deep-lane, unit-load AS/RS can be configured to meet a warehouse's throughput requirements and space limitations to produce the most efficient operation possible. By eliminating the significant aisle space needed for conventional storage, and making full use of clear height, high density AS/RSs can typically store 40% more inventory within the same physical building footprint.

For cold storage warehouses, this often results in significant energy cost savings of 30% or more. In terms of labor savings, while each DC's previous practices and AS/RS designs are unique, a single S/RM operating on three shifts can generally do the same work as three forklifts and nine employees.

Comprehensive services: The Westfalia team is able to configure an automation solution to meet site and industry specific needs, and keep that solution running reliably. Also, an AS/RS doesn't have to be implemented "Big Bang-style" that often shuts down the operation for extended periods of time. Westfalia's commissioning and service teams can often phase-in a deployment of their solution while allowing existing operations to continue to run.

What's more, they are able to configure an AS/RS to work as a seamless solution in combination with other automated systems such as layer picking, palletizing, and or truck loading. Ongoing maintenance services and remote diagnostics ensure the solution stays running reliably.

A WES software platform to orchestrate your operation: Automated warehousing equipment typically has some level of control or inventory software, but often it's just for governing the machine movements and tracking the level of inventory in the system. A true WES platform, by contrast, aligns all resources necessary for fulfilling order/shipment commitments, while managing inventory and optimizing material flow.

Westfalia's WES software (Savanna.NET®) uses application programming interfaces to synchronize data with enterprise systems, and can coordinate the flow of your entire operation, including non-automated workflows that rely on labor and fork lifts or order picking vehicles.

The completeness of these three elements is what ensures maximum payback from an AS/RS in areas like: space optimization, lighter labor requirements, reduction in order fulfillment cycle time and improved order accuracy. A multiple-deep storage AS/RS can carry an internal rate of return (IRR) of 20% or higher, but it's the complete automation approach that ensures that IRR level is fully realized over the long haul.

"There are various types of equipment that offer decent IRR, but the kicker with complete automation is that the payback is high for a system that will be productive for 20-plus years," says Dan Labell, president of Westfalia. "Without that complete approach, it's hard to be successful and fully realize the payback you expect over the long term."

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