

AS/RS & AUTOMATED LAYER PICKING SYSTEMS

A ROBUST, ROBOTIC COMBINATION

Integrating automated layer picking systems with automated storage and retrieval systems (AS/RS) to improve warehouse operations



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ARE YOU STRUGGLING WITH ORDER FULFILLMENT CHALLENGES IN THE WAREHOUSE?

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Westfalia 
OUR INNOVATION IS YOUR SOLUTION



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Many companies just like yours are struggling with order fulfillment due to current picking challenges and we have just the solution for you...it's automation! [Register to receive the recorded video of our webinar, "Conquer Order Fulfillment with the Union of Automated Storage and Layer Picking"](#) and discover how to overcome recent trends causing warehouse and order fulfillment challenges including:

- Labor availability
- SKU growth causing fewer orders per SKU and greater order complexity
- Filling orders quickly and efficiently

CONQUER ORDER FULFILLMENT WITH THE UNION OF AUTOMATED STORAGE AND LAYER PICKING

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A ROBUST, ROBOTIC COMBINATION

Although people aren't driving around in flying cars or living on the moon, the future is here in the realm of warehousing. Today, a growing number of organizations are turning to automation and robotics to improve operations and cut costs.

In fact, the 2016 MHI Annual Industry Report ranks robotics and automation as the top emerging technologies that will “transform and/or disrupt” supply chains over the next decade. The report also notes that 74% of its survey participants plan to introduce robotics or automation into their supply chain within the next six years.

As automation technology continues to rise, so do the challenges and complexities of running an efficient warehouse.



First, the number of SKUs is growing. This means that there are fewer orders per SKU, and therefore, fewer “traditional” pallet orders. Instead, orders contain a variety of products, stored in various areas of the warehouse. It is not uncommon for a warehouse to hold upward of 1,000 SKUs, even though it was built to hold just a couple hundred.

Second, warehouses have limited space for storing and staging orders, so many require **just-in-time (JIT) order fulfillment** processes. But, effective JIT operations are often hindered due to lack of reliable transportation. With an industry-wide shortage of drivers, companies are forced to pick and stage orders in advance, sometimes up to 24 hours ahead of time.

This not only clogs up valuable warehouse space, but also impacts manufacturers, who must have materials ready and products available sooner.

A third challenge is labor availability. It is difficult for warehouses to find good, reliable labor to perform repetitive material handling tasks – tasks that machines could carry out more efficiently and reliably. Also, because orders are more complex, picking requires more travel time, as workers must move from one end of the warehouse to the other to gather all items for

an order. It takes up additional, valuable time accurately conveying orders to human pickers.

Warehouses can overcome these challenges and set themselves up for greater overall efficiency by implementing an **automated layer picking system** integrated with an **automated storage and retrieval system (AS/RS)**. While both solutions offer their own set of benefits, you can maximize their value by using them in tandem.



AUTOMATED STORAGE AND RETRIEVAL AND LAYER PICKING SYSTEMS: A POWERFUL COMBINATION

When seamlessly integrated, an AS/RS and layer picking system create a powerful combination. But, before exploring the benefits of integration, you must first understand each of the technologies, their features and functionalities.

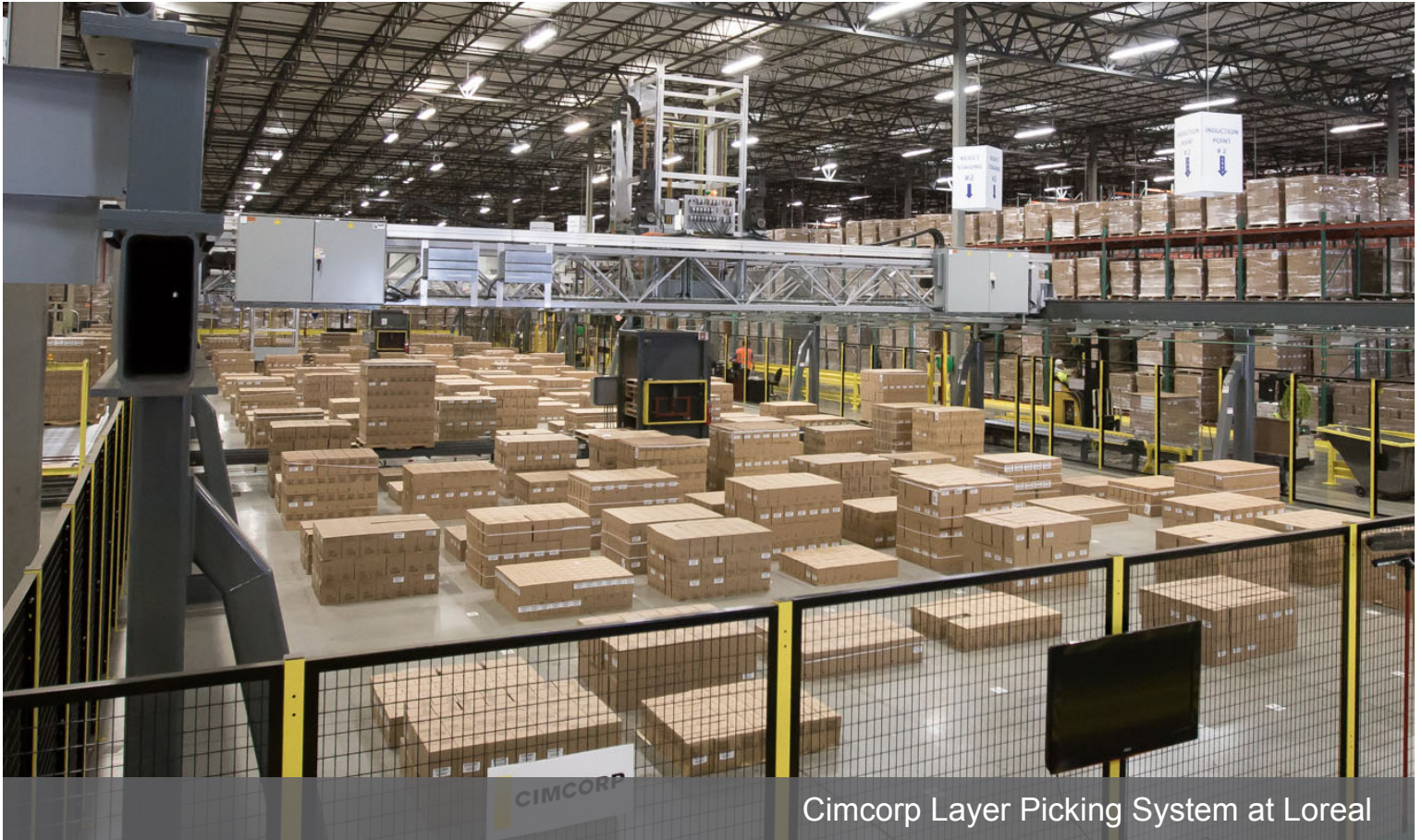
Automated Storage and Retrieval Systems:

Using a combination of robotics, equipment and controls, an AS/RS optimally stores, retrieves and handles goods within a warehouse. An AS/RS comprises the following: a rack system to store product; a storage and retrieval machine (S/RM) or crane that runs on a floor rail; a **load-handling device/shuttle** to move product from the crane to the rack location; and a **conveyor system** to move goods to and from the AS/RS and dock areas. When fulfilling orders, the system rapidly brings products close to the shelves, and the S/RM ensures that the picker has product available in the right position, at the right time.

Automated Layer Picking Systems:

Automated layer picking systems can pick a near limitless variety of products, access a large volume of inventory with a single machine and create orders in any sequence. A unique aspect of the solution is the ability to pick up one layer, multiple layers and even entire pallet loads of product to build rainbow pallets.

Additionally, a layer pick system can pick a single product or SKU from any location within any stack in minimal time. The system includes a robot, which combines a clamping tool and a large gantry that travels on two rails. Underneath the gantry is a staging area with a pallet of every SKU the company offers.



Cimcorp Layer Picking System at Loreal

The AS/RS will automatically replenish the layer picking system with inventory pallets. The layer pick then picks and palletizes the product in layers to be sent to the customer.

Not every industry has the opportunity to layer pick. Layer pick systems are ideal for warehouses and distribution centers that move more than 1,000 layers per day, with 50 to 500 SKUs picked in layer form. This is most common among **food/beverage** and consumer goods manufacturers who ship most of their orders to a regional distribution center.

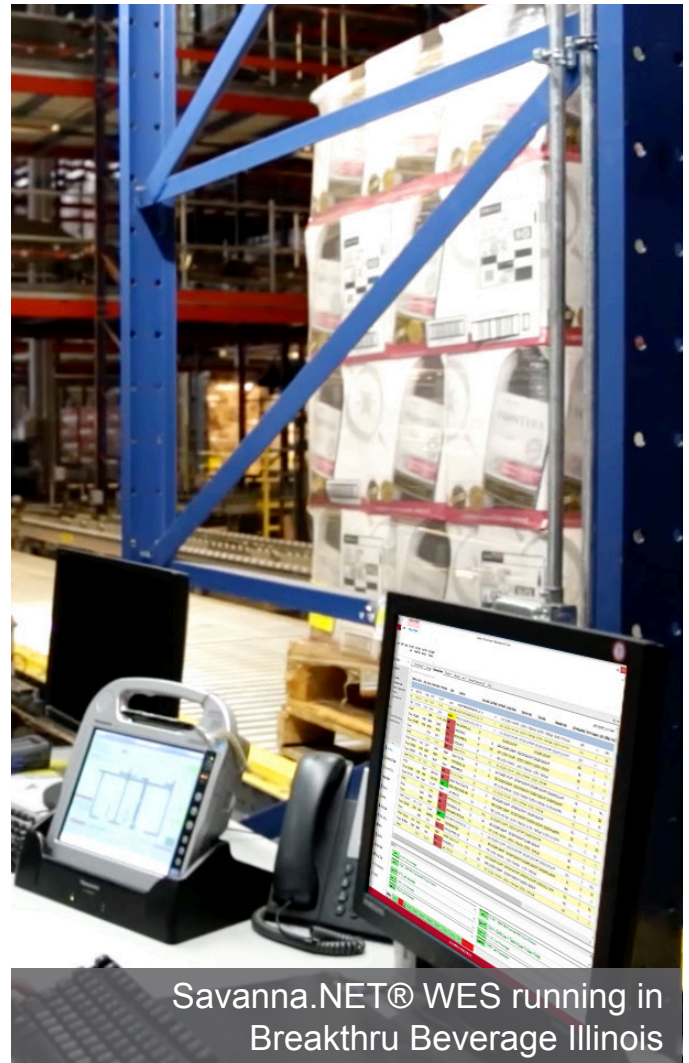
As a rule of thumb, automated layer picking systems are justifiable when 25 to 40 percent of a manufacturer’s volume is sold in full layer quantities. If less than 10 percent of the volume is full layer quantities, it may not be the best choice.

OTHER COMPONENTS OF THE INTEGRATED SOLUTION

Warehouse Execution Systems (WES)

A software system directs your automated operations. Typically, organizations use a **warehouse control system** (WCS) to communicate with a **warehouse management system** (WMS) and obtain order information, including SKUs, quantities and picking sequences. The WCS then directs the all equipment associated with the AS/RS, including layer pick tools.

However, the more pieces of automation in your solution, the better “brain,” or software system, you will need. Instead of separate WCS and WMS applications, many companies are opting for **warehouse execution systems** (WES). A WES combines the functionalities of these traditionally interdependent applications to seamlessly direct, control and optimize internal material flow and order picking, like the conductor of an orchestra.



Savanna.NET® WES running in Breakthru Beverage Illinois

There is no need for complex integrations, as a WES simplifies the entire warehousing process and can seamlessly interface with other equipment.

Almost every warehouse that implements an automated layer picking system also implements a staging solution.

Staging Solutions

As automation increases your picking speed, you will likely need a place for items to go en route to order fulfillment. A truck or sufficient warehouse space are not always available, and sometimes, your entire order isn't ready to go out the door. By adding an automated staging solution to the mix, you can more easily prepare the truckload in sequence, hours ahead of when it actually arrives.



Automated Staging Solution at The Glenmore Distillery

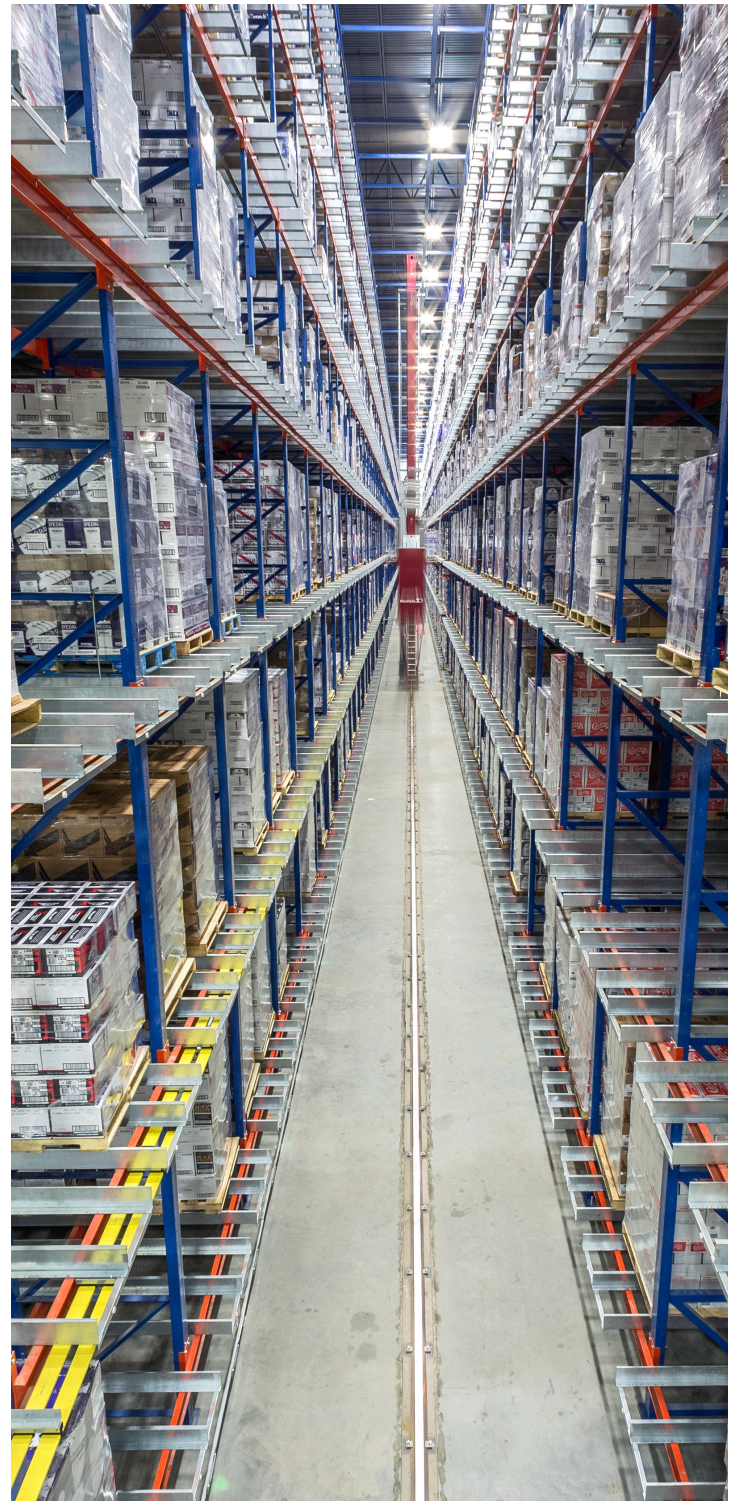
WHY INTEGRATE AN AUTOMATED LAYER PICKING SYSTEM WITH AN AS/RS?

Now that you understand the pieces of each solution and how they work, it's time to answer the big question: ***why should you integrate an automated layer picking solution with an AS/RS?***

Because there are a number of benefits that stem from this robust combination, there's not one simple answer.

- ***Instant, On-demand Replenishment:*** Integrating an AS/RS with a layer picking system creates an instant, on-demand replenishment process that is more consistent and reliable. Otherwise, manually replenishing the pick areas and getting the product to the appropriate area for picking is an arduous, time-critical task. If workers aren't delivering the right product at the right time, the entire picking process is interrupted. Or, when delivered manually, pallets arrive at the replenishment site skewed or leaning to one side. An AS/RS takes all these variables out of the equation, ensuring the right products are replenished when needed.
- ***Productivity:*** Without automation, picking is a repetitive, time-consuming manual task. There's also a safety factor involved and companies are now more willing to invest in machinery or equipment to eliminate heavy lifting or unsafe working environments. For cold storage warehouses, manual labor is especially hazardous. Workers must pick in sub-zero temperatures and require frequent breaks. With an AS/RS and layer picking system, you'll generate greater productivity by eliminating or reducing manual picking labor.
- ***Accuracy:*** When you ship an order, that order must be 100-percent accurate, especially in today's age when customer satisfaction is of utmost importance. An AS/RS allows you to select the right product from inventory, and the layer pick system pulls it to fill the order. On a similar note, customers demand freshness and quality. In the food and beverage industry, accurately selecting the freshest product and properly rotating inventory is critical. Tying an AS/RS to a layer picking system sets you up for maximum accuracy, and therefore, better product and customer service.

- **Speed:** Your order fulfillment process has a certain output capacity, which is limited by your workforce’s productivity rate. As orders become more complex, that output capacity decreases. Without the need for manual labor, an AS/RS and a layer picking system help you increase output capacity and shorten the order fulfillment window and timeline.
- **Better Space Utilization:** As the output rates get higher and order fulfillment processes get faster, the amount of available space has a bigger impact on your overall operations. The AS/RS and layer picking combination improves space utilization within existing assets – the warehouse. By retrofitting your warehouse with **automation technology**, you can more efficiently use the space you already have to store, pick and manage inventory. In fact, many warehouses are able to avoid expensive new construction or off-site storage altogether just by retrofitting their facility with an automated system.
- **Flexibility:** Integration allows your warehouse to “flex” better. In the past, automated systems were designed to meet the demand of the peak day – the highest volume day of the year. If you design your system around that day, you will hold your labor force captive to the system and use unneeded resources during the remainder of the year. An AS/RS and layer pick combo not only allows you to flex down, but also provides labor savings across the entire year (on both lower volume and higher volume days).



Westfalia’s S/RM within the AS/RS at The Glenmore Distillery

CONSIDERATIONS BEFORE IMPLEMENTING AN AS/RS WITH A LAYER PICKING SOLUTION

No two organizations are the same, so not everyone is capable of implementing an AS/RS, a layer picking solution or both. But, if an integrated AS/RS and automated layer pick system is a good fit for you, consider the following items before diving headfirst into a solution.

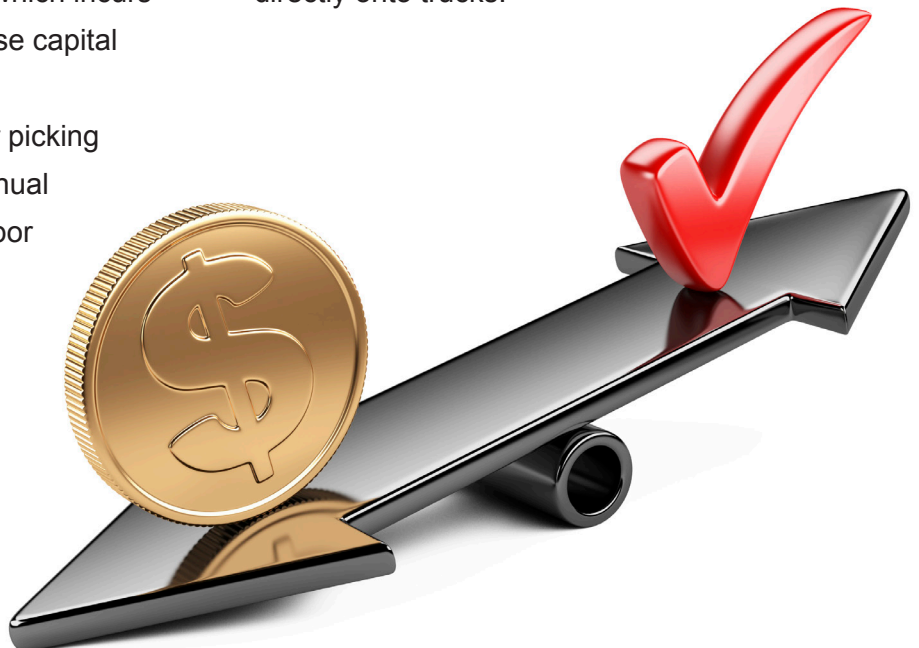
1. **Thoroughly evaluate operations.** Perform an in-depth analysis of your operations. What is your throughput? How many hours/shift is your operation active? How many pallets do you receive per hour, per day?
2. **Study order and SKU profiles.** What are the characteristics of customer orders? How much product is going out and where is its destination? Also, look closely at your SKUs. How many SKUs does the inventory comprise? Use the Pareto rule (80/20) to determine your optimal storage configuration (80 percent of your volume should be based around 20 percent of your SKUs).
3. **Get people involved.** Running an automated facility requires a labor force with a slightly more technical skillset. If your management team is onboard with automation, they should also take the time invest in proper training to ensure greater use and proper maintenance of the system.
4. **Plan for the future.** Avoid investing in a system you will quickly outgrow by creating a five-year plan. Look at your recent SKU growth and project how much volume you'll have in the next few years. Next, define your design year – how many years out do you want your automated facility to serve you? This will give you an idea of how to configure your system to grow with your business.



OBTAINING ROI FROM AUTOMATION

Automation may require a large upfront investment, but the returns are significant – and fast. With an AS/RS alone, typical ROI is three to five years. However, the savings will continue to rack up because today’s most advanced systems have 30-year lifespans. Here are a few areas where you can obtain ROI:

- Space Savings:** When compared to a conventional warehouse, an automated warehouse can store 30 to 50 percent more product in the same amount of space. An AS/RS can go higher and is much denser than a traditional rack storage system. In addition, by retrofitting an existing facility, many companies can eliminate the need for costly, new construction. It is often not necessary to build a new facility, physically expand the current space or lease outside storage, which incurs further logistics costs. In the end, these capital savings will pay for the automation.
- Reduced Labor:** An automated layer picking system eliminates 100 percent of manual picking, while an AS/RS increases labor efficiency and productivity by cutting down on the number of wasted steps in the material handling process. So, you are “doing more” with less labor.
- More Efficient Order Fulfillment:** Through on-demand/JIT order fulfillment, warehouses use less square-footage, less dock space and fewer people. This leads to faster truck turns because facilities can load more trucks and ship more product in a shorter window. You’ll also reduce the likelihood of incurring truck detention fees. Often, dock staging is not needed at all – an automated layer picking solution can load pallets directly onto trucks.





- **Taller Loads:** Layer picking systems can build taller loads than humans can build. If you can build a taller load, you can better utilize trucks and trailers, thereby saving on transportation and pallet costs. However, consider what's happening on the other end – verify that your recipient has the ability to unload the product from a higher level.
- **Less Energy Consumption:** Because automated warehouses require fewer interior lights and have less space to heat and cool, companies can reduce their energy costs by about 40 percent. Savings are even more significant in cold or refrigerated warehouses.
- **Traceability:** The layer pick system has the ability to track and trace every SKU within every layer of the pallet. The report of what has been built is available for review as soon as the pallet leaves the system. This level of traceability is ideal for food/beverage manufacturers who require detailed information about their food products as they make their way through the supply chain. Traceability ensures a high level of food safety.

Of course, there are many other benefits that lead to “intangible” ROI, such as improved accuracy, decreased product damage and greater customer satisfaction.

SELECTING A VENDOR — OR VENDORS

Implementing an AS/RS with an automated layer picking solution can have big payouts— if you have two top-of-the-line systems to integrate.

Implementing an AS/RS with an automated layer picking solution can have big payouts— if you have two top-of-the-line systems to integrate. Oftentimes, this means working with two vendors. Although the “one-stop shop” is appealing, it doesn’t mean that one company can provide the best AS/RS and layer picking solutions, or that the systems will meet your needs and operational requirements. In fact, it can actually be more beneficial to work with two separate, best-of-breed vendors, instead of opting for one company that conveniently provides both solutions.

To obtain the right integrated solution for your operations, you not only need to select the most reputable providers, but also ensure that the two vendors can work seamlessly and successfully together.

If you take the time to analyze your vendors and ensure that they work well together, you will reduce the amount of management and go-between for your team. As a result, you’ll receive an effective, unified, well-supported automated solution, carefully tailored to meet your needs.

Here are some questions that can help you in your search:

- Are the two vendors a good fit for one another— from a systems point of a view?
- Can they work together as one, collaborative business team?
- Do they have experience in your industry to understand my unique needs?
- Have they worked together before?
- If so, have they been successful with past implementations?

TRANSFORM YOUR SUPPLY CHAIN WITH AUTOMATION

As more companies embrace robotics and automation as a means of transforming their supply chains, the market will only become more competitive. Therefore, it is an opportune time to consider how integrated automated layer picking systems and AS/RS can enhance your warehousing operations.

With the efficiency, speed, flexibility, accuracy and cost savings realized through this powerful combination, you'll support your business' future growth and avoid getting stuck in the past.



CASE STUDY: THE BIG CHEESE



Problem:

A leading manufacturer of dairy products needed to invest in a new facility to meet rising consumer demands. The manufacturer sought a solution that would allow for more pallet storage without requiring a large facility, costly additional construction or future outside storage.

Solution:

Westfalia Technologies, Inc., installed two **automated storage and retrieval systems** (AS/RS), one high bay and one low bay, which allowed the facility to store more pallets and cases per square foot. To replenish the AS/RS, the manufacturer brought in **Cimcorp** to implement two **layer pick gantry robot systems**. The robots are replenished by the AS/RS and handle 200 to 250 SKUs that are picked in layers daily.

Result:

By implementing both solutions, the dairy producer was able to build a new facility that would not only provide a high return on investment (ROI), but would also meet its 20- and 30-year growth plans. With less square footage needed for the systems to operate, the company was able to construct a smaller building without losing valuable storage area. Additionally, the company can now easily scale production up or down to meet and exceed daily throughput goals, as well as meet consumer demands during peak and off-peak days.

System Specifications

High-bay and low-bay AS/RS

- 4 tandem S/RMs
- 10 levels and 6 levels high
- 14,799 total storage positions
- 41,776 total square feet

Advanced Layer Picking and Automated Truck Staging

- 2 layer picking gantry robots
- 245 layer pick positions
- 2 transfer cars
- 630 automated truck staging pallet storage locations

Software

- Westfalia's **Savanna.NET® Warehouse Execution System** (WES)

INTERESTED IN LEARNING MORE ABOUT AUTOMATED STORAGE AND LAYER PICKING?

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Derek Rickard,
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