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an AS/RS is the right fit
for your operation

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Q&A



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INSIDER Q&A:



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As grocery and general merchandise fulfillment centers grow more complex, operators are under pressure to increase throughput, control labor costs and make every cubic foot of warehouse space count.

Automated storage and retrieval systems (AS/RS) have become one of the most effective ways to handle complex fulfillment operations with larger SKU assortments and faster fulfillment cycles without expanding a facility's footprint. The key is knowing when this automation will deliver the biggest return.

When implemented at the right scale, automation changes how an operation performs, drives higher throughput and lowers fulfillment costs. But it's not a one-size-fits-all solution. Success depends on factors like order volume, SKU velocity, labor availability and future growth plans.

In this Insider Q&A, David Scheffrahn, Vice President of Sales - North America at Ocado Intelligent Automation, shares how automation reshapes warehouse performance, when AS/RS delivers the biggest payoffs and what drives a successful deployment.

Q: *How is cubic storage different from other AS/RS formats?*

A: Traditional AS/RS systems, like mini-load cranes or shuttle systems, are aisle-based. That design creates two key limitations. First, it caps throughput for each aisle since the overall fulfillment rate depends on how many cranes or shuttles can fit into a single aisle. Second, it introduces a single point of failure. If a crane or shuttle breaks down, the inventory in that aisle becomes inaccessible, which can be risky during peak periods.

The Ocado Storage and Retrieval System (OSRS), was engineered to overcome those limitations. Instead of aisles, it uses a modular grid structure that stacks totes densely to make the best use of available space. Robots travel across the top of the grid, and any robot can access any tote, from any column, at almost any time. That parallel processing design delivers higher throughput, greater resilience and more efficient use of warehouse real estate.

Q: *What key operational indicators signal that a facility might be ready for AS/RS?*

A: Automation conversations usually start when an operation is running out of space. Systems like the Ocado Storage and Retrieval System are designed to maximize throughput and make better use of every cubic foot of a facility. When you're looking to expand or move into a larger building, that's the time to evaluate how an AS/RS can help you grow without adding square footage.

If someone is outgrowing a current facility, their first thought is whether they can use their vertical space more effectively. Instead of moving, they might be able to go up in the building and add storage capacity through automation. That's often the trigger point for companies that are ready to invest in an AS/RS.

Q: *What factors should companies weigh before committing to an AS/RS?*

A: An AS/RS is a major investment that delivers long-term value, but it works best when a company has a clear view of its growth and demand forecasts. When you're confident about future volume and product mix, automation offers the lowest cost per item fulfilled and the strongest operational return.

If your business outlook is less certain, there are still ways to introduce automation strategically. Our Ocado Mobile Robot Systems, for example, give companies flexibility to scale up or down as demand changes. That approach can be a smart first step toward full automation while keeping options open for the future.

Q: *How does labor availability influence the decision to invest in AS/RS?*

A: Many operations overlook how automation expands their labor pool. AS/RS work is less physically demanding than traditional warehouse jobs, so companies can hire from a wider range of candidates.

At one of our customer sites in Florida, for example, the general manager says she no longer competes for the same workers as nearby warehouses. Instead, she hires people who want steady work that doesn't require walking miles a day or climbing ladders. That shift helps her build a more reliable and diverse workforce, even in a crowded logistics market.

Q: *Do order profiles and SKU velocity affect AS/RS-readiness?*

A: Definitely. Operations that handle more orders per day or manage a larger SKU range reach the automation tipping point sooner. As order volumes and SKU velocity grow, manual picking becomes harder to sustain. That's when an AS/RS delivers real gains in throughput, accuracy and cost per order.

Q: *What are the deployment times for an average-sized AS/RS project?*

A: Most AS/RS installations are part of new-building or expansion projects, although they can also be deployed in brownfield sites. A typical project takes about 12 months or more from start to finish.

However, customers can use our mobile robot technology, Ocado Mobile Robot System, immediately in their existing facilities to gain early benefits while their AS/RS installation moves forward. It takes time to get it right, but that investment in the AS/RS pays off once the system goes live.

Q: *Beyond WMS integration, what software capabilities help companies get the most out of their AS/RS investments?*

A: Most companies already have a warehouse management system (WMS), but the real advantage comes from the execution layer that runs the automation. Our Fulfillment Execution System (FES), part of our Ocado IQ software suite, connects with any WMS to manage the real-time flow of orders, robots and inventory.

The FES optimizes what happens inside the four walls—from picking to replenishment to dispatch. It gives operators visibility into system performance so they can make quick adjustments and keep throughput on track. When everything works together, companies get more consistency, higher productivity and lower cost per order.

Q: *How is AI or machine learning being incorporated into AS/RS software to improve slotting and forecasting?*

A: In a traditional warehouse or shuttle system, slotting takes a lot of manual planning. With a cubic AS/RS, it happens automatically through AI-enabled dynamic slotting. The system learns which items are picked most often and moves them closer to the top of the grid, while lower-velocity SKUs naturally migrate toward the bottom.

That process keeps fast movers within easy reach, improves pick efficiency and reduces cycle times. It also works dynamically as order patterns change. For example, seasonal items move up in the grid during peak demand, then get stored deeper once the season ends.

Artificial intelligence also supports forecasting and inventory planning. It identifies trends and helps determine how much space each product category will need over time. As a result, operators can make smarter slotting and replenishment decisions without the need for constant manual oversight.

Q: *What best practices help ensure a smooth AS/RS deployment?*

A: Successful automation starts with good change management. Operators need to understand how the system works and how it supports their daily routines. Training is simple because the interface walks users through each step. Most can learn the process in about 15 minutes.

Before installation, we build a full digital model of the warehouse. That lets customers see how the system will perform, identify challenges and fine-tune workflows before construction starts. It shortens the learning curve once the system goes live. And because Ocado Intelligent Automation designs, deploys and historically operates its own systems via Ocado Retail, we know how to guide customers through the process and help them reach full productivity faster.

Q: *How can AMRs and AS/RS complement one another to create a more flexible fulfillment strategy?*

A: For many companies, AMRs are a bridge to full automation. Because AS/RS installations can take time or require new construction, customers often start with AMRs to gain immediate efficiency and labor savings while planning for their long-term goods-to-person system.

It's a walk-then-run approach that delivers quick results and builds experience with automation. AMRs can provide about 70% of the benefit at roughly 25% of the cost, making them a smart first step.

They also handle items that don't fit in the AS/RS grid, such as bulky or irregular products. That creates a long-term synergy between the two technologies, with AMRs managing out-of-grid inventory while the AS/RS focuses on high-volume storage and retrieval.



Q: *What sets Ocado Intelligent Automation apart in the automation space?*

A: Ocado supports more than 150 fulfillment operations worldwide, including 26 large-scale grocery sites. In the U.S. we're known for providing the automation technology behind Kroger Delivery. In the U.K. we operate our own online grocery business, so we don't just design automation systems, we use them every day at scale. That real-world experience shapes how we approach automation design and deployment.

Our focus has always been on driving the lowest cost per unit fulfilled. The metric we use to measure that is units per labor hour, which tells us how efficiently each operation runs. Every year we work to improve that number, and in 2024 alone we increased units per labor hour by 8 percent.

High-density goods-to-person systems like the Ocado Storage and Retrieval System let operators maximize throughput, reduce labor costs and maintain accuracy. Over time, that combination delivers the lowest cost per unit and the strongest return on investment.

Q: *How do you see AS/RS technology evolving over the next five years?*

A: AS/RS technology is still early in its evolution, but the momentum is definitely picking up. Robotic picking is advancing quickly, and we expect it to become standard in most automated systems within the next few years. We're already handling millions of picks a day through automation, and that number continues to grow.

Over the next five years, we'll see tighter integration between systems, higher density storage and smarter orchestration across the entire fulfillment process. The goal is a seamless environment where software, robotics and analytics work together to maximize throughput, accuracy and efficiency.



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