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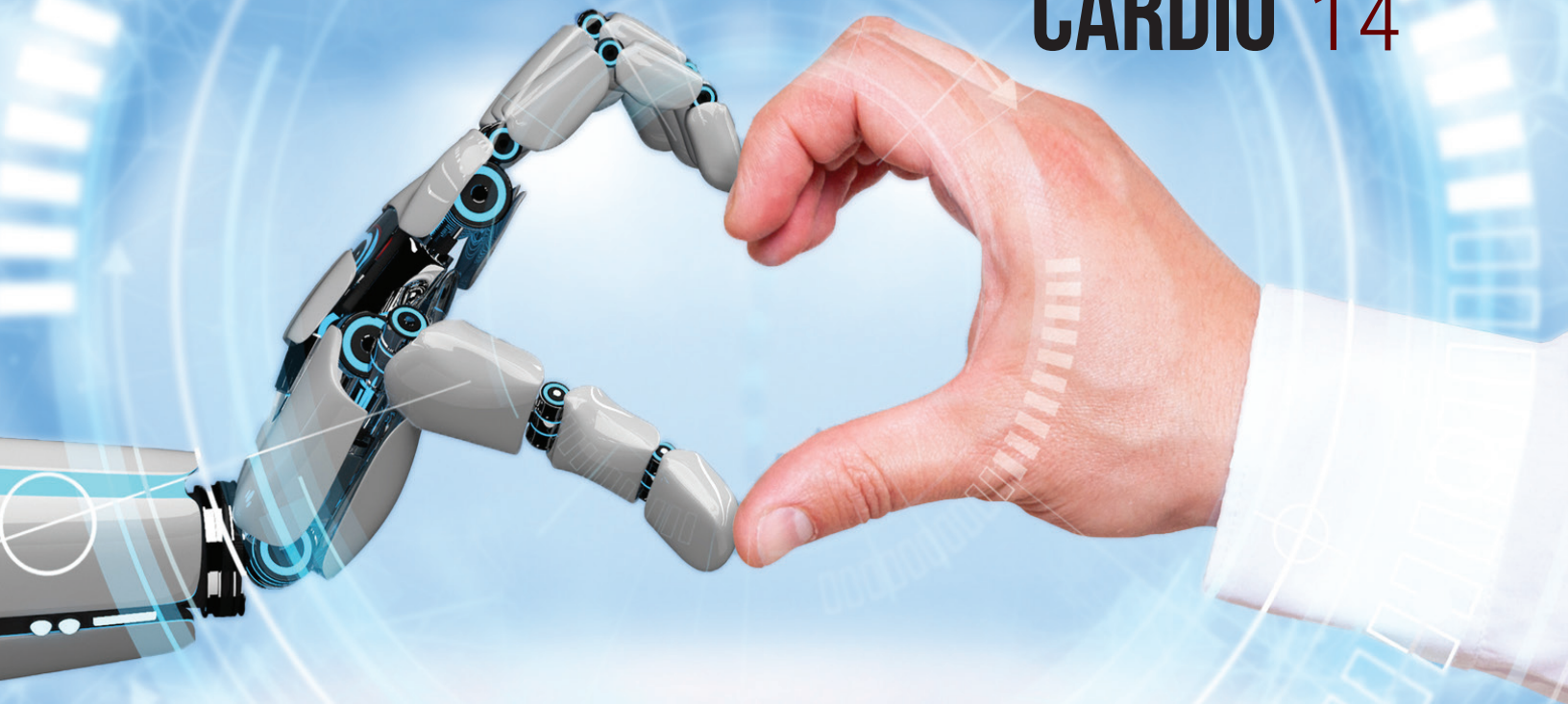# SATELLITE REVIEW MAGAZINE

SOLUTIONS FOR AUTOMATED MATERIAL HANDLING

ISSUE 8

THE SUPPLY CHAIN NEEDS SOME CARDIO 14

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Automation Keeps the Supply Chain Pumping

By Morgan Walker
Marketing Communications Manager,
Westfalia Technologies, Inc.

Today's supply chain is in need of a checkup. Many factors like the labor shortage (with an even more dire driver scarcity), inflated demand, an e-commerce boom, and a backlog of shipping containers off the coast are all affecting the health of the supply chain. While COVID-19 certainly exacerbated these issues, many warehouses are left in the balance of meeting demand while managing a hectic supply chain.

I have chosen to focus this year's The Satellite Review on "The Health of the Supply Chain." Every industry has felt the effects of recent disruptions, creating unprecedented challenges for manufacturers, warehouses, distributors, and logistics providers. The road to recovery won't be easy but there is a remedy to help resolve the challenges facing the supply chain. With warehouses at the heart of the supply chain, automation keeps products flowing from the storage area to the dock to the customer. So, what keeps the supply chain pumping? Reliability. Safety. Availability. Capacity. All ingredients to a successfully automated warehouse and, ultimately, a healthy supply chain.

The articles within this issue shed light on the ins and outs of warehousing automation and how a trusted automation provider, such as Westfalia Technologies, can help. We will explore why choosing to take the step toward automation will help avoid the effects of unexpected disruptions and ensure success as we head into the "new normal." Integrating the right technology to streamline warehouse processes is one piece of the puzzle to keeping that supply chain healthy. An automated storage/retrieval system (AS/RS) significantly increases efficiency thoughout all operations from automated case picking to turning trucks faster to accomodating growth.

However, it's not just about researching what types of automated equipment is out there. Choosing the right partner to help you on that journey is equally important. Westfalia is made up of a team of experts who strive to create the best automated system for your needs—with support throughout the process from planning and design to installation, training and service. A consistent and reliable partner can help reduce today's operating and maintenance costs, while preparing for future capacity needs.

In this issue, we'll cover topics such as how recent disruptions are affecting the health of today's supply chain and warehouses, optimizing automation in your warehouse, the importance of aftermarket services, and areas to evaluate for a successful AS/RS implementation.

While the supply chain won't be fixed overnight, warehouse automation can play a huge role in optimizing efficiency and steadying the pulse. Now take a deep breath, and dive in. ■

KEN'S FOODS SELECTS WESTFALIA TO AUTOMATE NEW WAREHOUSE

Westfalia Technologies, Inc., a leading provider of logistics solutions for manufacturers and distributors, announces its automation technology will be installed in the new Ken's Foods, Inc. warehouse located in McDonough, GA.

Westfalia's Automated Storage/Retrieval System (AS/RS) and Savanna.NET® Warehouse Execution System (WES) will fully automate the food manufacturing company's 343K sq. ft. facility. This will be Ken's Foods' second location that incorporates Westfalia's warehouse automation solutions.

Ken's Foods produces salad dressings, sauces, and marinades for a global network of customers. Westfalia's technology will provide a reliable, temperature-controlled warehousing environment with a customized solution addressing all material handling, automatic layer picking and integrated case picking requirements, while delivering almost zero touches from receiving to shipping. The Savanna.NET® WES will streamline operations and provide seamless software integration between Ken's Foods' ERP system as well as all storage, order selection, and material flow automation.

"Ken's Foods Inc. has benefited greatly from the automation that Westfalia provided in our Massachusetts facility," said Jim Bourne, Director of Transportation and Offsite Distribution at Ken's Foods. "The system has allowed us to expand our operation in a smaller footprint and handle activities in an accurate and efficient manner. We look forward to putting a second system into our supply chain at the McDonough location as we continue to grow and meet our customer's needs."

"Warehouse automation is critical for today's food manufacturers to effectively keep up with high demand and a shrinking workforce" said Dan Labell, President of Westfalia. "We are confident our automated warehousing system will optimize the McDonough location and operations for Ken's Foods and are thrilled to continue our long-standing partnership with them."

The new warehouse will be built across the street from the existing Ken's Foods manufacturing facility, further simplifying operations and taking more than 40 trucks off the highway each day. ■

WHY YOU SHOULD INVEST IN WAREHOUSE AUTOMATION

The majority of supply chain decision makers face common challenges: accurately tracking inventory in and out of the facility, excessive material handling causing damage or product quality issues, inefficient space utilization and more. The sheer number of moving pieces in any logistics operation means that one wrong step could trickle down into all other areas of the supply chain. One way that many companies are looking to solve these issues is through automation.

In 2019, warehouse automation grew to a $15 billion industry, and by 2026, those numbers are projected to double. But it's estimated that nearly 80% of warehouses are still operating without automation, sacrificing valuable time, quality, and resources. So what is warehouse automation and how can you get started? Here's what you need to know:

What Automation Technology Is Available?

An automated warehouse solution can be installed in either existing facilities or newly constructed buildings. The former will likely include installation and disruption planning of some type, but also require far less capital. New facilities allow existing operations to continue with minimal disruption.

In either scenario, the technology behind automated warehousing can help your business run smoother and smarter:

Automated Storage / Retrieval System (AS/RS) – AS/RS technology is a modernized warehousing and storage solution. Typically, these systems are made up of technologies including storage/retrieval machines (S/RMs) for pallet and case handling, automated layer pick systems, case release systems, conveyors, shuttles, etc., to name a few. With AS/RS, the entire warehouse process can be automated from production through outbound staging and shipping and everything in between.

At Westfalia, these systems are customizable to fit the space and support the underlying data metrics supporting the design. Storage depths can vary from single deep to 18 deep, with storage areas between aisles able to be serviced by both aisles to provide redundancy. AS/RS technology can often double or triple storage capacity and throughput, enabling future growth and often eliminate the need to purchase more land or build off-site.

Automated technology like smooth conveyance equipment and layer picking solutions not only makes the production, storage and distribution processes more efficient, it also reduces the number of touches on a particular product, which can improve product accuracy, quality and freshness.

Warehouse Execution Systems (WES) - A WES uses real-time data to optimize material flow throughout your warehouse, continuously providing an efficient use of space and equipment. The cloud-based data analytics offered with a WES increases order accuracy, reduces losses, and boosts throughput and productivity—and can be integrated seamlessly into your existing technology!

Integrating a high-density AS/RS with a WES can manage the automation, issuing tasks to machinery seamlessly, while also managing any remaining manual operations such as truck loading, or low volume case picking, which may not have been fully automated due to economic justification results.

Are There Downsides To Automation?

For a newcomer to warehouse automation, the process can seem overwhelming and it's no secret that having the latest technology and overhauling a facility for automation can be a significant investment. But you'll find that payback periods are generally less than 5 years, and once you experience the benefits, it's hard to imagine operating a facility "the old way". Your automation partner will work with you, streamline the process, and be able to design the best solution for your warehousing needs.

What's In It For Me?

Despite initial costs, warehouse automation will prove to be the smartest decision you can make for your business. Here's why:

#1. Efficiency - Automated systems speed up warehouse processes in order fulfillment and shipping, meaning you can take on more orders and push more orders out the door faster.

#2. Flexibility - When demand skyrockets and your operation isn't equipped to handle it, an automated warehouse can operate 24/7 and take full advantage of the time available. When properly designed, orders can be pre-picked and staged for the next day, and peak shipping days are handled more productively as the automated systems operate at higher utilization levels.

#3. Safety – While improved efficiency is often measured using labor standards, having an automated system means you have machines doing the heavy lifting for you, turning what could have been a safety hazard into a risk-free boost in productivity. Free roaming fork-lifts can be hazardous, and automation simply reduces this risk significantly.

#4. Smaller Footprint – Whether you're looking to minimize square footage or reduce energy usage or cost, an AS/RS is designed to use space more efficiently. Westfalia's high-density automation technology allows warehouses to store pallets up to 18 positions deep and can generally support racks up to 140' high. This can reduce energy usage by 30% and reduce space needed by 40% - 200% (depending on system height and density) when compared to a conventional warehouse.

Where Do You Go From Here?

Every warehouse is different, facing unique challenges that need customized solutions. Westfalia's dedicated team of experts is here to help find the right solution to fit your unique needs. Our team's approach starts with a comprehensive data analysis, which allows us to take a deep dive into how your business operates and find the right solution for your business needs. ∎

TEST YOUR CONTROLS IN A FULLY VIRTUALIZED ENVIRONMENT

By Ian McGregor, Business Development Manager, Emulate 3D

The case for testing control systems off-site using an accurate response model is well known, and the advantages are clear. Connect the actual control hardware to a dynamic 3D model of the system or machine under test, and then introduce virtual loads to trigger virtual sensors. These sensors are connected to the control program which can then drive the model, and you have created a valid testbed for the system. This dynamic digital twin approach enables controls testing to be done off the project's critical path, and carried out earlier in the project cycle than would otherwise be possible. Testing sequences can be carried out safely in an office environment, and in many cases they can be automated. This approach has been successfully employed for several decades, leading to more fully tested systems with lower commissioning, launch, and maintenance costs. Reducing uncertainty around the commissioning and ramp up of a new automated system is clearly of considerable value to all stakeholders. As modeling technology emerged which made its use convenient and accurate, the rapid spread of its use for virtual commissioning came as no surprise.

The past few years have seen a further step in development which removes a constraint from the process and enables a more flexible and persistent solution to be available to users. Most current virtual commissioning systems comprise the system or machine model, which replaces the actual system under construction and the control system, or a part of it. The model is often initially developed for discrete event simulation purposes, where several iterations of layout and equipment choices are tested for suitability before deciding on the best solution according to a set of criteria. The model resulting from this experimentation phase forms the basis of the generally more detailed controls testing model, where the operational logic is supplied by the external control system. As the control system comprises standard pieces of equipment, this is also available to the controls engineers at any point in order to carry out testing of the project's critical path.

However, over the years controls testing teams have signalled two identifiable sets of conditions where it becomes problematic to carry out further virtual testing in this way.

The first of these is when the physical system is at the stage where the real control system can be installed. The controls equipment which, up until that point, was not required on site and could be conveniently used for virtual commissioning is now taken to the site to be installed within the real system. Virtual commissioning which uses hardware in the loop becomes inoperable without the hardware.
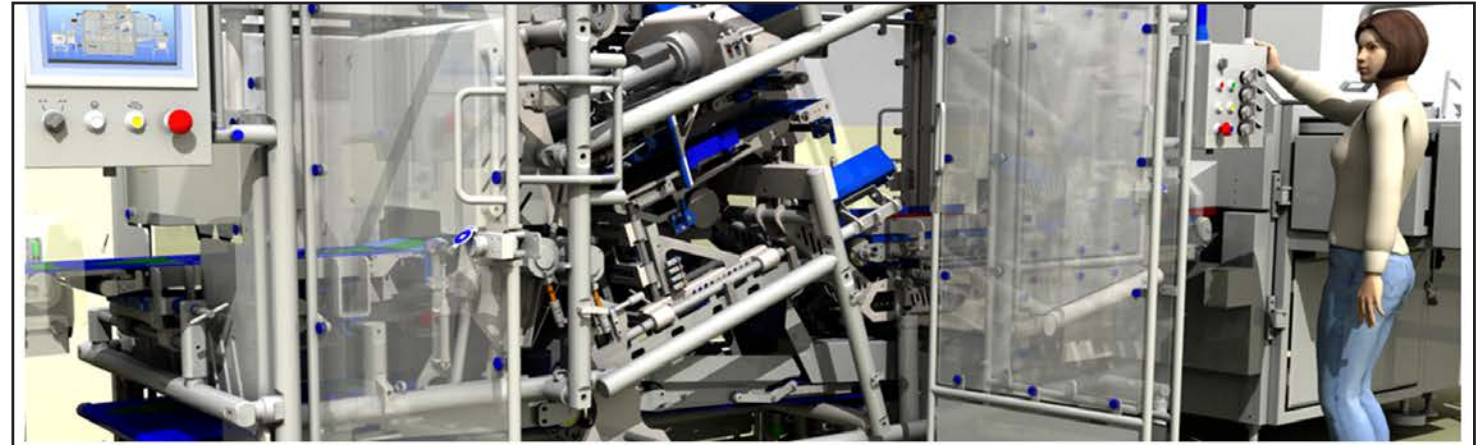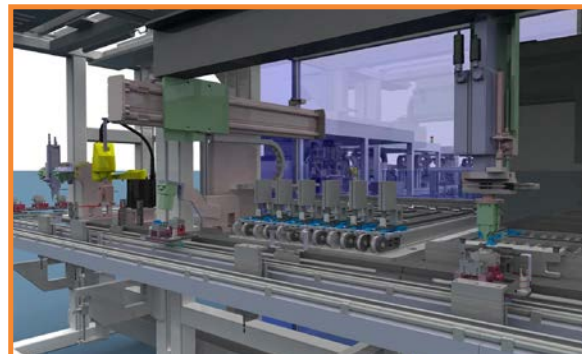
The second situation can arise at any time when the operational system needs to be modified for whatever reason – it would make sense to test the proposed changes virtually, and offline, but the controllers needed to do this are operational and cannot be taken offline without consequences and additional cost.

Fortunately we are now seeing the emergence of technology which neatly avoids both of these issues, and provides a robust and readily accessible solution. The solution is the accurate virtualisation of the controllers themselves. Users can now create control programs and upload them to a virtual controller connected to a virtual representation of the machine or system. Development and testing can now be carried out without the need for any industrial hardware in the loop, and virtual systems can remain active and useful during system commissioning, through ramp and beyond.

Users can bring up a configuration of models and virtual controllers mirroring any real system in order to implement and then test changes in the digital twin before intervening in the real system. By testing exhaustively in the virtual system, intervention time to implement changes in the real system

is minimised, reducing the impact and cost of changes on production.

Automated system end users, machine builders, and systems integrators alike benefit from the virtualization of material handling equipment and process machines, the control system, and many of the component parts. This approach shortens the development cycle and its associated costs, yet makes it easier to build, test, and operate robust automated systems. The approach also prolongs the useful life of the system as it reduces the risks and costs of system modifications, making their implementation a more straightforward decision. ∎

IS AS/RS RIGHT FOR YOU?

3 AREAS OF YOUR WAREHOUSE TO EVALUATE

It is undoubtedly a big decision deciding whether or not to invest in warehouse automation. Not all automation solutions are ideal for every warehouse or distribution center and taking that step forward can seem overwhelming. However, with appropriate planning and a strong automation partner, evaluating your current processes and identifying the right time to transition to automated warehousing is not as complicated as it may seem.

Here are three challenges that can be solved with an Automated Storage/Retrieval System (AS/RS) and why it might be time to take the leap:

#1. The Labor Crisis

The state of the supply chain throughout this year has proven the value of a strong workforce. However, when there are more job openings than there are unemployed workers, warehouse operators must search—and even scramble—to find solutions to their labor issues. Whether the shortage is being felt on the warehouse floor or at the loading dock, an AS/RS can aid in consolidating manual labor positions while increasing efficiency.

Even if your order pick processes remain manual, integrating your picking operation with a well-designed AS/RS will reduce the number of pallet touches and lessen the chance of human error or product damage. If your AS/RS is coupled to manufacturing, you could have zero human touches on the pallets until it is time to pick. AS/RS replaces the need for people to do the put-away and replenishment of pick locations. This can reduce fork-truck pallet handling staff by more than half, making labor savings significant.

#2. A Focus on Sustainability & Land Use

To be a future-focused business in today's complex landscape, businesses need to put sustainability at the core of their strategy. An AS/RS is an ideal solution to make that first step.

Land restrictions can significantly limit expansion plans. An AS/RS is designed to be built vertically, instead of over a large area of land, making automated warehouses space efficient and cost-effective. In fact, an AS/RS can store 40% to 200% more pallets in the same space as compared to a conventional warehouse (actual percentage is based on height and density of design). This opens up more land for green space, and less space brings lower energy costs. A refrigerated or freezer warehouse that utilizes AS/RS, can often see a 30% reduction in energy costs as well as the associated environmental benefits.

#3. Inadequate Space for Manual Processes

Sometimes the justification for an AS/RS has less to do with replacing labor and everything to do with expanding load-out and order selection capabilities in the smallest space possible. By going vertical with your storage and automating the replenishment process, you can have more pickers working in a smaller space, which makes them more efficient. Since the replenishment is automated, they will always have product ready for them to pick from, which will reduce missed picks. This can lead to more productivity. We have seen pallet jack operations reach 350 cases/man-hour when picking to multiple pallets on one pallet jack.

Plan Ahead

So, you've decided to explore automation in your warehouse. To get the most out of the investment, make sure to design the rack and materials handling solution before deciding on the building size. We have seen clients regret their choices when planning this in reverse order. Make sure that the solution is completely data driven, using raw order data to establish peak performance requirements. These numbers can then be grown to a design year appropriate for your strategic planning. With a typically less than five-year payback, and a 25+ year lifespan, AS/RS is the ideal future-proof solution to achieve long-term business efficiency.

One last piece of advice: don't wait to start the conversation! While expediting an AS/RS build is possible, it usually takes roughly 14 to 16 months to design, build and implement an AS/RS. It can take even longer to get the capital expenditure approved within your organization. ∎

OPTIMIZING AUTOMATION
DESIGNING A DISRUPTION-PROOF WAREHOUSE

With the buzz surrounding the broken supply chain and the immense labor shortage, it's no surprise that many warehouses are scrambling to find solutions. Many of these challenges—the truck driver shortage, general labor shortage, freight idling at ports and an increase in consumer demand—are greatly impacting operations within warehousing facilities.

Designing for Disruption

A crucial element to a warehouse designed to overcome these challenges head-on is automation. For those who have embarked on automating their systems, or those who are thinking about doing so, it is imperative that the investments in time, cost, and resources are laser focused on extracting maximum value and flexibility. Too often, expectations are mismanaged, or the preparation needed to embrace automation and deal with its idiosyncrasies is lacking. Even worse, designing flexibility into the system is often overlooked, as are practical ways to grow the system, accommodate differing order characteristics, and in some cases, the absence of IT infrastructure to support new or existing software and firmware systems.

To design a warehouse that is as "disruption-proof" as possible requires a command of both hardware and software systems from the provider. Solutions that are resourcefully pieced together from multiple vendors or locations often become obsolete when combined as a system. This is primarily due to a lack of standardization, which leads to an insufficient long-term vision of how these pieces develop over time.

As automated systems grow more complex, ask yourself:
- How many entities are required to support the system long-term?
- Are all sourcing locations committed to long-term support of the product?
- Do they have the same vision for their product lifecycle?
- What software platform will have the flexibility to tie these systems together and ensure adequate standardization to enable upgrade paths and long-term support?

Developing a set of clear standards is critical to accommodating multiple support alternatives—in-house and/or vendor provided—as well as train operators and maintenance staff across numerous facilities.

Keeping it Simple

The industry is experiencing a wave of new technology and fresh concepts that make big promises without the expertise or history to back it up. Instead, future-proofing automated warehousing solutions comes down to good old-fashioned quality coupled with proven, robust, and simple solutions. In fact, the simpler the better. Often, the genius in a design is how fundamentally easy it is to build, commission, operate, and maintain. Fashionable, new technology may not hold up to the rigor of 24/7 operation, nor deliver on promised performance goals.

Choosing the Right Team

A proven track record and a commitment to quality from vendors who are passionate and personally invested in the success of the system should be the standard for today's prudent investor. As we read about the pace of mergers and acquisitions, a consistent change of leadership, rotation of technical talent, and desire to maximize revenue, rather than value, it is harder than ever to accurately predict whether the design and implementation teams will be there long-term.

Make this a point to evaluate: corporate culture is important and often guarantees the staying power and overall experience when implementing these systems.

Factoring in Cost

Optimizing the spend on automation is also no trivial matter. Capital budgeting techniques, such as Internal Rate of Return (IRR) or Net Present Value (NPV), are commonly used, and design options within an automated solution can be complicated to evaluate. Each option can, and often does, have its own justification—and should be analyzed as such. Product damage and maintenance costs are often overlooked and can impact a project's IRR. Extracting the best value requires a deep understanding from people who are experienced in operations and who will be honest about the role that these costs play over time.

An Honest Evaluation

Future proofing a solution to avoid disruption may require some compromises in the design as well. For example, sizing an automated warehouse involves clarity around packaging and unit load size requirements. Large automated systems can be difficult to alter structurally, so sometimes a small sacrifice in storage density can provide the flexibility to accommodate future packaging changes or palletizing patterns. Regardless, sizing the maximum load envelope is critical to ensure smooth operations without re-work at the dock. So don't rely on the packaging engineers' drawings to establish the envelope of the system. Measure "real" product, discuss with the team, and receive buy-in from all affected parties to get these design dimensions right.

Integrating the Right Software

Finally, limiting disruptions within automated warehousing facilities requires integrated software recovery tools to ensure any issues can be handled expeditiously. These tools should be well integrated at the software and firmware level, ensuring that data and tracking information remains uncompromised during any manual intervention. Technology and development platforms, like Unity, offer incredible 3D visual interface experiences that provide significant information—in an easily digestible format.

In summary, we can do a lot to future-proof an automated warehousing solution. The concepts noted above are a few key guidelines to keep in mind. Most importantly, partnering with competent experts who have the experience and track record to prove it will ensure your warehouse can handle today's challenges and the unknown ahead. ■

THE SUPPLY CHAIN
NEEDS SOME CARDIO

HOW WAREHOUSE AUTOMATION IS THE WORKOUT
TODAY'S DISRUPTED SUPPLY CHAIN NEEDS

The supply chain is a lot like the human cardiovascular system, with the heart being equally dependent on pressure and healthy veins; without each channel doing their part, the system can't function. This has become clear amid the current state of the supply chain, with these struggles expected to continue throughout 2022 and beyond. This is causing long-term warehousing and logistical challenges along with global shortages on essential goods like food and PPE. It's time the supply chain gets back in shape, but first, it's important to know how we got here.

A Fatigued System

There will forever be a before and after COVID, used as a stamp in time before we reach what we've deemed the "new normal." However, it's important to note that there were supply chain issues that predated the global pandemic, including escalating trade tensions and tariffs, as well as the ever-dwindling truck driver shortage.

With the e-commerce boom, online sales have soared causing logistical nightmares to keep up with demand. Other factors, such as Brexit, furthered complications in the supply chain in 2020, with obstacles at every turn. The entire shipping line coordinates with logistics companies to carry around 90% of world trade. But logistical issues are just one ailment in today's supply chain challenges.

Shipping containers are also in short supply. For context, pre-pandemic shipping containers cost roughly $5,000. The demand is so high that as of October 2021, they have reached a new height at $20,586 each—specifically impacting Asia to U.S. trade. Given this significant increase, costs in the rest of the supply chain, including retail shelf products, are rising along with it. Because of this, import shipping vessels are waiting to dock. With ships idling off the coast, fewer shipping containers are in rotation, increasing the already strenuous demand. Even rail distribution has been affected, with backups sometimes up to 25 miles long.

Once the cargo is finally inland, the pulse of the supply chain is still slow. The truck driver shortage is a phenomenal obstacle to overcome. Considering that 70% of goods are transported by truck in the U.S., drivers are the key to keeping the supply chain, and therefore the economy, stable and healthy. Capacity issues at ports, long wait times to deliver and pick up freight along with the pressure of inflating demand, the trucker shortage is ever-looming. With both the unemployment rate and job openings high, manufacturers and distributors are getting hit with a labor shortage that's impacting every industry.

We've outlined the many uncertainties in the state of the supply chain, and it's no secret these issues can't be solved overnight. However, there are solutions that can help alleviate our current supply chain issues and inevitable future disruptions. The doctor is in, and we have the exercise plan to keep the supply chain moving—and luckily, this one doesn't include burpees or a daily serving of broccoli.

Steady the Pulse with Warehouse Automation

Warehouse automation is at the heart of the supply chain, addressing workforce and shipping complications while maintaining smooth operations. Persevering through these disruptions is crucial to the health of the economy and sustaining everyday life around the globe. It's one of the smartest investments you can make for the longevity of a warehouse and distribution network, with payback periods mostly reached in under 5 years.

How exactly does warehouse automation create business longevity and a healthy supply chain? Here are just 5 benefits to implementing this warehouse fitness plan:

1. Addresses Driver Shortages: Automating warehousing frees up workers to other tasks, an immense help in smooth operations and getting products loaded onto trucks so they can hit the road. If warehouses are the pumping hearts of the chain, trucks are the vessels delivering oxygen. A huge bottleneck in the chain is truck drivers waiting in long lines to get to loading docks, and Automated Storage/Retrieval Systems (AS/RS) make it possible to turn trucks quickly and get them where they need to be faster. For example, by automating their previously manual processes, Heaven Hill Distillery has been able to ship products 400% faster than before and cut down on dock times by 49%.

2. Uses Data to Drive Efficiency: Westfalia acts like your personal trainer when it comes to installing and maintaining an AS/RS. A comprehensive data analysis of a warehouse can offer a fresh look into how a business operates, addressing critical material handling challenges. Westfalia's Savanna.NET® Warehouse Execution System (WES) is what gives companies control over warehousing needs, creating a single user-friendly system that offers real-time analytics and a proactive approach to warehousing and distribution.

3. Solves the Labor Crisis: On the warehouse floor, order picking is a laborious task and can often lead to human error, but by automating the process not only is there a reduction in labor needs and costly mistakes, it also allows those workers to focus on more complex areas of warehouse operations. Automation means the warehouse can operate 24/7, too, with safer working environments and, ultimately, positive ROI.

4. Adds Reliability and Flexibility: Investing in warehouse automation is a long term solution to not only address the massive labor shortage, but also to embrace market changes in general. AS/RS offers flexible, customizable options—whether starting from scratch with a new build or implementing automation into an existing facility. Future disruption is inevitable, but an automated warehouse has the technology and data to ensure it can face any fluctuations in demand.

5. A Greener Choice: With an eye to the future, AS/RS minimizes carbon footprints up to 50% by reducing energy usage and building materials. Automated facilities can also store up to 80% more product in the same amount of space when compared to traditional warehousing facilities. Building with AS/RS is the key to bringing warehousing into a sustainable future.

The challenges facing today's supply chain are plenty. But with a healthy dose of automation in your warehouse, it can be a huge step in solving many of today's disruptions. If we all do our metaphorical push ups and eat our figurative veggies with automation, we'll be well on our way to a healthy supply chain. ∎

SCALING ORDER FULFILLMENT WITH A STATE-OF-THE-ART WES

After an unpredictable year, no company or industry is a stranger to disruption. Whether it's a global pandemic, a ship blocking a major trade route or a shortage of drivers, we've all grown accustomed to unpredictability. But when it comes to warehousing, logistics and the supply chain, a volatile environment can uproot even the most established organizations.

The many disruptions we've experienced over the past year highlighted the need for companies to flatten the ebbs and flows of their supply chain. We now know the unexpected should be a part of your fulfillment strategy. Whatever that disruption might be,

having the ability to quickly react and proactively adapt to move products through the network is key for today's companies.

According to Business Insider, "2022 is expected to be the first trillion-dollar year for online sales." And consumers are demanding faster and more accurate deliveries than ever before. Scaling order fulfillment is a critical piece in adapting to these changing consumer demands and evolving market conditions.

How can your company go about implementing order fulfillment strategies to scale for business growth or lower than average volumes? A successful order fulfillment strategy begins with ware-

house design. Implementing an Automated Storage/Retrieval System (AS/RS) controlled by a state-of-the-art Warehouse Execution System (WES) allows you to increase inventory accuracy, scale for growth, and meet customer and consumer demands.

These various types of equipment and technology incorporated into an AS/RS all work together to automate the entire warehouse, which in turn, helps scale order fulfillment. AS/RS can do this in several ways:

#1. Increasing Inventory Accuracy

When it comes to maintaining an accurate record of your inventory, there's no better way than to use the technology behind today's leading automated warehouses. The conveyor system works to deliver product to the right pickup location, from which the S/RM accurately and safely picks the product and places it in the designated storage location.

Automating this storage and retrieval process reduces the need for excess material handling, and therefore mitigates human error or damage to product. Not only does this improve productivity, but it allows for greater accuracy throughout the order fulfillment journey—in product volume, location within the warehouse and timely distribution to the customer.

#2. Optimizing Warehouse Efficiency

A one-size-fits-all solution to order fulfillment is simply not an efficient way to manage the storage and retrieval of products in and out of your warehouse. High-density AS/RS allows warehouses to hold more product in the same location, instead of products being spread out across a network of several warehouses. Whether you're scaling for high or low order volumes, holding inventory within a single location gives you the ability to combine or customize processes as these changes occur. For example, a manufacturer's product demand might increase dramatically during the holiday season but slow down heavily in the summertime. With a high-density, automated warehouse, they can stay within the same warehouse throughout the year, using only the space required, without needing to coordinate extra warehouse space or reconfigure manual storage and retrieval processes.

Plus, inventory consolidation allows quicker access to inventory, thus requiring less time to retrieve and deliver it when needed. Simply put, AS/RS allows for

a more flexible, consistent and efficient warehouse.

#4. Using Data to Transform Order Fulfillment

Today's modern warehouses can have up to tens of thousands of SKUs, millions of delivery locations and a complex supply chain that can be nearly impossible to manage effectively without the right system to back it up.

With a plethora of warehouse software to choose from, the two typically considered are Warehouse Management Systems (WMS) and Warehouse Control Systems (WCS). Usually, the WMS manages the warehouse operations, including inventory tracking and lot management, while the WCS manages the operation of the automation equipment.

A Warehouse Execution System (WES) marries the WCS and WMS functionality together—bringing order fulfillment into a single system. From pick path and order planning to receiving and inventory tracking, WES is key in managing this complex information accurately and efficiently. Additionally, a WES has built-in order planning capabilities, which helps warehouse personnel to determine inventory, logistics availability and order demand. A WES provides all of the tools needed to track your product and manage your inventory, manage and direct your equipment, and manage staff workload within a single application.

A state-of-the-art WES can create a more efficient, accurate and flexible warehouse. Coupled with AS/RS technology, businesses can have a competitive edge to accommodate customer needs and supply chain demands.

Staying Proactive Amid Disruption

Scalability and order fulfillment really come down to the robustness and flexibility of your software and technology within your warehouse. To manage the many unknown disruptions ahead, a high-density AS/RS and WES are critical in maintaining a proactive business model. From labor shortages to fluctuating demand, there are many challenges ahead that will force companies to think differently. As we emerge and learn from the pandemic, it's critical for businesses to implement efficient and creative ways to scale order fulfillment before the next disruption hits. ∎

MORE THAN JUST PROACTIVE: AS/RS MAINTENANCE NEEDS TO BE REGIONAL

Westfalia's Aftermarket team is growing rapidly, and for good reason: our Service offerings are key to the long-term success of our customers. We understand that a transition to automation can be a bit daunting and overwhelming; Aftermarket Operations are here to maximize that investment and relieve concerns as our customers get comfortable with their systems, providing preventive and, if needed, reactive maintenance and system support on a 24/7/365 basis.

While all the buzz is surrounding the current labor shortage and broken supply chain, and rightfully so, there are other trends all warehousing and distribution companies need to adapt to in our fast-changing world:

1. **Overextending obsolete systems:** Astonishingly, some of today's leading companies are still relying on equipment that was installed in the 1980s or 1990s. While it may still be running, these businesses are just one failing part away from significant downtime, revenue loss, customer dissatisfaction, and costly emergency equipment upgrades. When equipment becomes outdated, spare parts are hard to come by and systems are often left unsupported.
2. **Faster innovation cycles:** As technology advances, innovation cycles grow shorter and shorter. Staying up to date with new technology is crucial to maintaining a competitive advantage and reducing the risk of upgrades. Upgrading frequently in smaller steps is always more manageable.
3. **Growing size and complexity of equipment:** Smaller system installations are far less common these days. As warehouses and shipping orders grow more complex, so does the size and complexity of equipment.
4. **Changing regulations:** No business is immune to the ever-changing regulations and occasional red tape thrown our way, regardless of industry. Staying compliant is central to business success and managing risk.

Automated Storage/Retrieval Systems (AS/RS) are mitigating many of the demand and disruption issues plaguing today's warehouses. Aftermarket Service Teams are here to provide the knowledge you need to stay ahead of automation challenges and provide best practices when moving to and maintaining AS/RS.

Reactive vs. Proactive Maintenance

Traditionally, planned downtime is primarily reserved for quarterly equipment inspections. Little time is allocated for repairs stemming from these inspections, cutting into the time needed for the next planned inspection. With this approach, warehouses experience more and more unplanned downtime windows that inevitably have a major impact on production over time. Follow-up is slow after these routine inspections and a reactive strategy is costly, especially if the Service Team is located hundreds of miles away. To make each visit cost efficient, a large amount of work is usually consolidated into a short downtime window. However, this reactive strategy requires a larger, more costly workforce to perform all required maintenance in limited time and often need to take place on weekends and nightshifts to reduce impact on production—driving up costs even further.

There's a better way to perform necessary maintenance in your warehouse: Lean, frequently recurring planned maintenance broken down into smaller windows of time results in significantly shorter downtime episodes with little to no impact on operations. Plus, follow-ups for corrective action are significantly quicker if issues arise, instead of waiting for the next quarterly maintenance window.

What used to be an intrusive, reactive, and slow-to-respond upkeep schedule suddenly turns into a quick, flexible, and proactive maintenance strategy. This is, however, only possible with a regional Aftermarket Services presence from the specific AS/RS supplier.

A Regional Approach

Customers are often spread out geographically from their equipment and maintenance supplier, adding significant travel costs or extended downtime to sustain the value of each service visit. This often pushes much needed maintenance off to a later date.

However, a regional Aftermarket Service Team can provide preventive maintenance much more frequently, shifting the cost from travel time and expenses to value-added maintenance hours. In the event of unplanned downtime, the team is just around the corner to save the day, with specialized tools on hand and in some cases even key spare parts nearby. And most importantly, regional service teams allow for a much faster response time to provide repairs after preventive inspections, instead of waiting for the next quarterly event.

With this proactive, regional approach, system availability and reliability are unmatched. Ultimately, system availability is the entire bottom line when investing in automation. In addition to proactive and preventive maintenance, there are several ways warehousing and manufacturing companies benefit from an Aftermarket Service Team to ensure system availability including:

1. **Onsite spare parts inventory:** Spare parts availability is crucial to the success of timely maintenance, planned or unplanned.
2. **24/7 software remote support:** Helping in the event of warehouse management and execution software issues, and even with customer IT environment challenges.
3. **24/7 controls remote support:** Using over the phone and real-time system analytics to support resolution of system disruptions.
4. **24/7 emergency parts support:** If onsite inventory has a gap, your provider should have common key parts in their inventory and get that part to you as quickly as possible.
5. **Emergency on-site support dispatch:** Specialists that physically come onsite to help solve any issues when the issue cannot be resolved remotely.
6. **Training:** Invest in Knowledge Management to standardize, optimize and preserve best practices. Your solution provider should offer custom training opportunities to further increase proficiency of your operations and maintenance resources.

Being proactive is the key to warehouse efficiency, flexibility, and ROI. With a dedicated Aftermarket Services Team, your warehouse will successfully adapt to shifting markets and industry disruptions. Westfalia Technologies is a dedicated partner not only during periods of maintenance, but from the very beginning of a project to ensure proper installation, equipment selection, and longevity of the solution. We proudly design and manufacture our automated systems in the U.S., using only top shelf industrial component suppliers, providing the highest quality solutions, and supporting it with a customer-focused team concentrated in key regions. ∎

AUTOMATING OUT OF LABOR SHORTAGE DIFFICULTIES

The labor shortage and supply chain breakdowns have become such issues that major suppliers have encouraged consumers to begin shopping early in times of high demand, like during the holidays or seasonal shifts. If they don't, shoppers will face long delivery times, empty retail shelves and inflated prices. As retail sales rise, along with e-commerce and online sales projected to boom, labor shortages are real concerns for businesses to fulfill these increases and satisfy customer demand.

The shortage is affecting nearly every industry. Given that workers themselves are a crucial element in the supply chain, something must give to keep the supply chain running as smooth as it can in these uncertain times.

From April to June 2021, 11.5 million Americans quit their jobs, and in June there was a record-breaking 10.1 million job openings. This great exodus isn't over, with economists predicting that the shortage will persist far into 2022.

But there's hope: A long-term, sustainable solution to labor shortages is automation, which economists would classify as general productivity gains. Improvements in productivity over the last 50 years have kept inflation at bay and have generally shifted our economy away from manual, difficult-to-perform jobs.

With more job openings than available workers, investing in automated warehousing is a smart business decision that helps global enterprises stay future-ready, adapting to the inevitable disruptions ahead.

Automated Storage/Retrieval System: A Labor Shortage Solution

Automated Storage/Retrieval Systems (AS/RS) are customized solutions that enable companies to organize inventory, optimize space

and increase efficiency in many areas of their warehouse operations. It's also a way to address the labor shortage within the supply chain, which has a positive impact on other industries as well. Along with the lack of warehouse workers, the global truck driver shortage has been a challenge, even before the pandemic. With AS/RS, trucks are turned faster using automated staging and prep areas, so they spend less time waiting to be unloaded and can hit the road sooner.

AS/RS addresses the labor shortage in a variety of other ways, including:

- **Accuracy:** Automating data collection makes for more efficient operations and provides the tools to make more informed and smarter business decisions without the need to backtrack and correct human errors. The software delivered with these systems handle advanced shipping notices when possible and allow for more streamlined receiving.
- **Reliability:** Machines don't call in sick, need time off or worry about the spread of COVID-19, and they run 24/7 (or however often you need them).
- **Flexibility:** Implementing an AS/RS is a long-term solution that, when designed properly, can withstand future market changes and preserve expected ROIs.
- **Redeploying Workers:** Automating mundane tasks frees the employees to focus on driving the business forward, rather than just keeping it running. Those positions associated with operating an AS/RS are also easier to fill and retain, often creating strong career paths for workers.
- **Increased Visibility:** With a data-powered and software-centric AS/RS, taking physical inventories are usually not required, and predictive maintenance based on data centric machine diagnostics can be well planned and organized.

On top of addressing the labor shortage, AS/RS also promotes sustainability—reducing overall building footprints by 40% to 200% versus conventional warehouses and lowering energy costs by 40% in cooler/freezer environments. AS/RS can also be implemented in existing structures, saving costs by avoiding off-site storage expansions and utilizing space more efficiently than a traditional, manual warehouse.

Warehousing is complex, and automation can make operations more efficient, cost-effective and flexible. No matter what order fulfillment strategies are required to meet your business objectives, warehouse automation will continue to play a key role in improving economic productivity. ■

THE CLIMATE OF THE
COLD CHAIN INDUSTRY

The rise in supply chain challenges that have emerged as a result of unforeseen circumstances has created a domino effect in the warehousing industry, especially within the cold chain. Once a niche market, increased demand on the cold chain was accelerated due to the pandemic. According to Forbes, approximately 90% of third-party logistics respondents report that their companies plan to expand their cold chain capabilities and service offerings. Many respondents also noted that cold chain services are important to the future growth and development of their businesses.

As the cold chain industry continues to grow, the state of many existing cold storage facilities are deteriorating. According to Richard Thompson, international director of supply chain and logistics solutions at JLL, a global warehouse developer, 78% of cool and cold storage buildings in the United States today are more than 20 years old, and many were built of thick concrete limiting size and flexibility. As the global climate rises, the need for more cold storage space rises with it. This has initiated the exploration of cold chain solutions for more manufacturers than ever before. In addition to the aging of cold storage structures, the inability to expand the current facilities to enable growth is a concern. Due to a number of factors, including population growth and increased consumer demand, the need for expansion capabilities of manufacturing facilities is essential to the success of a business.

As the demand on the cold chain continues to increase and companies are searching for cold storage solutions, there are many obstacles that can stand in the way of business growth. Amid a worldwide labor shortage, the challenges of recruiting and retaining talent are prominent given the extreme working conditions inside a cold storage facility. The number of employees willing to work in these frigid temperature conditions is limited and those who are already employed are being paid premium wages and offered ample benefits and perks to stay. There are also increased health risks and concerns for employees that work in cold storage environments resulting in the potential increase of workers compensation claims and company insurance costs. According to the British Frozen Food Federation cold exposure, particularly for long periods of time, can be a trigger for certain underlying diseases or preexisting medical conditions such as asthma or cardiovascular conditions; thus, further limiting the number of employees that are able to work in cold storage facilities. Employee retention is also a concern. The manufacturing capabilities of traditional production facilities rely solely on the human workforce, making employee retention a priority. Not only is the current labor shortage and the "Great Resignation" a Human Resource nightmare, the shortage will also have long-lasting economic impacts on the manufacturing industry and has already initiated a domino effect on all other related industries.

For those reasons, manufacturers are turning to warehouse automation. Automated Storage/Retrieval Systems (AS/RS) create a buffer between supply chain disruptions and their impact on the manufacturing industry. While the initial investment in an AS/RS might seem like a tough decision to make, the benefits of automation far outweigh the challenges the industry is currently being faced with and payback can typically be achieved in only a few short years. One benefit of automation is eliminating human error and improving order accuracy, especially in an environment where time sensitive and perishable products are being stored. Other benefits include increased productivity and storage capacity. Westfalia's automated storage solutions allow facilities to maximize storage space while minimizing building footprint by capitalizing on the unique attributes of AS/RS, such as heights reaching 150 feet, allowing building footprints to be greatly reduced.

Making the switch to automation can be particularly beneficial to a cold storage facility. Finding employees to work as efficiently and with the accuracy of an AS/RS in extreme working conditions is impossible. An AS/RS is designed to operate without restrictions or downtime in temperatures as low as -35°F. Compared to human labor in the same environment, there is far more downtime for breaks and shift changes resulting in less efficient work. It is also important to note that an AS/RS is not impacted by labor shortage challenges. Similar to the temperature challenges of a cold storage facility, the labor shortage and employee retention issues have far less impact on warehouse productivity because production does not rely solely on human labor. Since an AS/RS is capable of operating with significantly fewer employees than a traditional warehouse operation, there is less pressure to recruit and hire employees to ensure the warehouse will continue to run efficiently.

Those are just a few of the benefits of warehouse automation, specifically AS/RS, can provide to the cold chain and manufacturers today. However, the challenges these companies face aren't always as black and white as they seem. Given the uncertainty in the manufacturing and supply chain industry today, it is more important than ever to evaluate the switch to automation alongside a trusted partner. Westfalia's team of automation and data analysis experts are able to design a custom solution to address current warehousing challenges and your unique business needs. The time to turn to automation is now and taking the plunge into automation will help your company ensure supply chain resilience and prepare for future business growth. ∎

E fficiency has long been the driving force behind warehousing automation advancements. Robots and machinery can complete repetitive and complex tasks faster, safer, and more precisely than humans could, but what about the advantages of automation in terms of the environment?

"Going Green" is no longer an optional route for many companies as it cuts waste saves money and helps the environment. According to James Ellsmoor, a Forbes 30 Under 30 entrepreneur, 86% of businesses see environmental efforts as a necessary step towards staying financially competitive while 82% also believe it benefits their public image. This is reinforced by a recent Nielsen report that suggested a majority (73%) of consumers would change their consumption habits to reduce their impact on the environment, and almost half (46%) would switch to environmentally friendly products.

Reduce Energy Expenditures

A warehouse utilizes a lot of energy for lighting, maintaining climate control, and moving products from production to storage to shipping. Given how expensive it can be to maintain a warehouse, it is crucial to minimize energy expenditures. Automation can help by:

- **Operating in a lights-out environment.** Lighting is rarely required outside of maintenance and viewing for an automated warehouse because it can operate in a lights-out environment compared to the lighting that is needed for workers in a manual warehouse which can lead to higher energy costs.
- **Reduce emissions from forklifts.** An automated storage/retrieval system (AS/RS) can reduce the need for combustion engine-powered forklifts traveling long distances through the warehouse to retrieve products. An AS/RS uses a strategically designed rack system with incorporated storage/retrieval machines (S/RMs) to store and retrieve product within the warehouse.
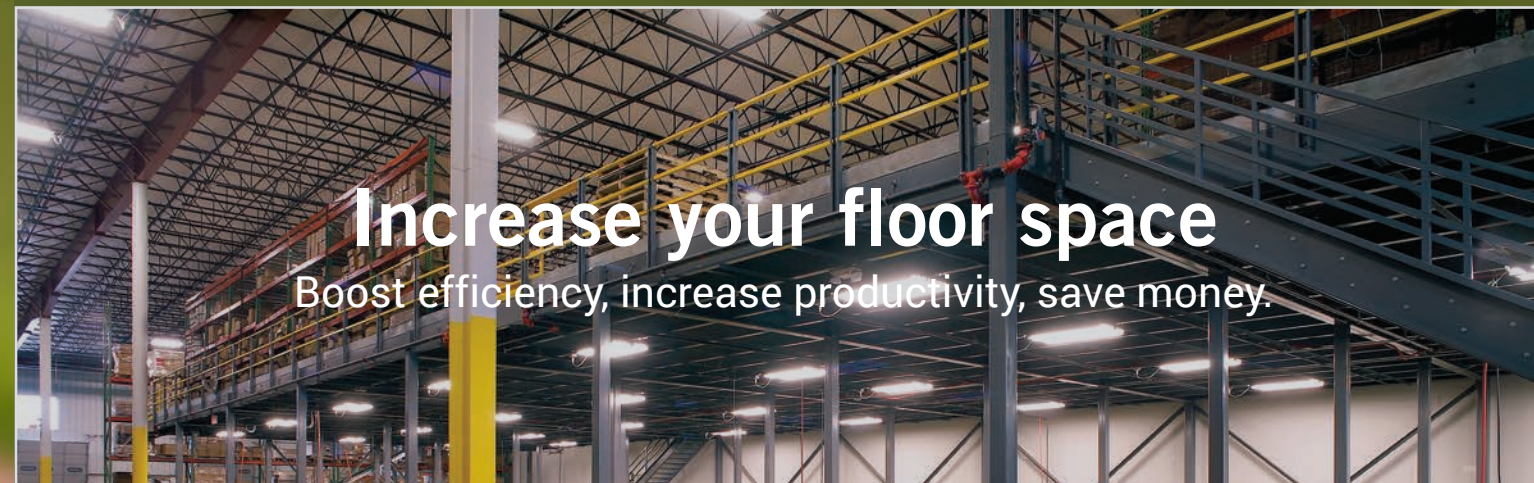
Minimize Mistakes and Waste

An AS/RS with an integrated Warehouse Execution System (WES) such as Westfalia's Savanna.NET®, directs the automated equipment to store and retrieve the product in as few touches as possible. This, coupled with minimal human and fork truck touches, helps to reduce product damage and breakage. Fewer touches needed to complete a process leads to fewer opportunities for mistakes.
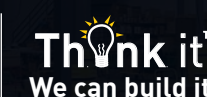
Inventory accuracy is crucial and with a WES, you can validate your inventory in real time. This can help reduce picking and fulfillment errors that could result in:

- **Lost Sales.** A single picking error can have a significant impact on a customer's overall impression of a purchase.
- **Returns.** Additional shipping costs along with repackaging or a loss of item that has been returned adds to the extra expenses.
- **Labor Costs.** Wwasted labor hours spent on the mistake in addition to the restocking expenses.

Companies can save money and establish themselves as industry leaders in sustainability by implementing warehouse automation technology, like an AS/RS. You may set yourself apart from the competition and enhance customer loyalty by building an industry reputation for being environmentally friendly. Whether you refer to it as sustainability, preservation, or going green, it may help reduce waste and save money while also benefiting the environment. ■

HOW AUTOMATION CAN SAVE MONEY & THE ENVIRONMENT