Choosing a Warehouse Automation System:

5 KEY CONSIDERATIONS FOR THIRD-PARTY LOGISTICS (3PLs)

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INTRODUCTION

The explosion of eCommerce in recent years has created an even greater need for sturdy, reliable supply chains. Consumers are demanding prompt, customized shipping and real-time visibility on the status of their shipments. Retailers are focusing on driving growth in their core businesses, so they are outsourcing product shipping, deliveries, and returns to third-party logistics providers (3PLs). Today's dynamically changing retail landscape is feeding the growth of 3PLs and the expansion of outsourced warehouses.

As a service-based operation, 3PLs need to be agile, responsive, and accurate. To help meet customer expectations for accelerated delivery, 3PLs are looking for ways to make warehouse operations more efficient. Streamlined fulfillment requires full visibility of inventory, as well as intelligent decision-making capabilities. Additionally, automation of repetitive tasks like picking, replenishment, and putaway enables 3PLs to keep productivity levels sufficiently high enough to keep up with demand, especially given the ongoing challenges of finding hourly workers.

Following are 5 key considerations for 3PLs to keep in mind when identifying technology solutions to adopt for their own warehouses. Using this lens to assess optimization and automation solutions will help providers comb through all of the systems available to find the one that can help expand their business and ensure operations are optimized.

D2C fulfillment and the need for random access to inventory

Today's consumers want unlimited options of products available at a click of a button. They also expect direct delivery to their homes next-day or sometimes even same-day.

In the past, the logistics chain was much more straightforward: warehouses delivered bulk quantities of a single SKU on pallets to stores, and then consumers would travel to stores to select and purchase the items. The warehouses designed to fulfill in that model are now being used to fulfill orders in a new complicated direct-to-consumer (D2C) model versus store replenishment.

> The direct-to-consumer model requires random access to inventory, making fulfillment processes more complicated, expensive and time-consuming.

Warehouse workers need to access literally thousands of SKUs that are ordered in random quantities and combinations and at random times. More labor is required in the warehouse and more touches are needed to organize and select products to fill customer orders. In this model costs quickly escalate, especially for next-day delivery orders to meet service-level agreements.

Because of this added complexity and the need to focus on boosting the performance of their core business, retailers are turning to 3PLs to outsource functions such as shipping, deliveries, returns and replenishment.
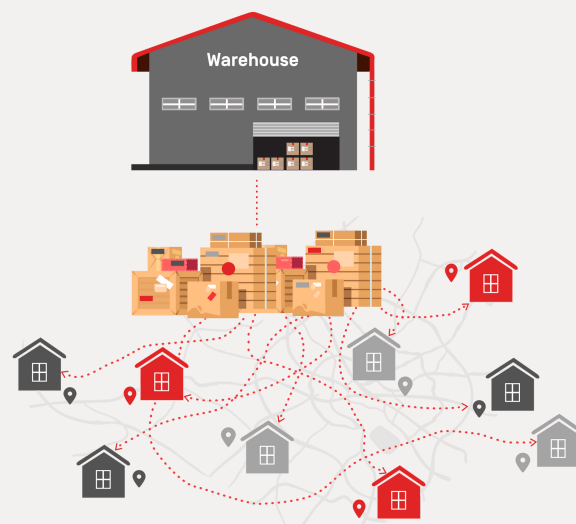
Traditional retail
Warehouses deliver products on pallets to stores and customers travel to stores to purchase items.
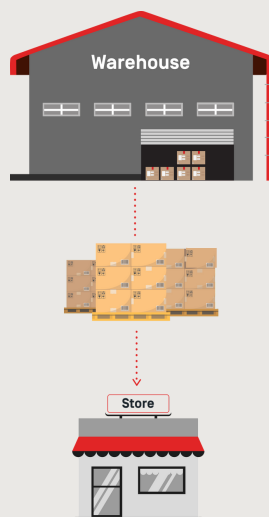
Direct-to-Consumer
Warehouse workers need to access thousands of SKUs at random locations in the warehouse to ship them to customers' homes.

Modernizing warehouses with AI & robotic automation

Without enough workers to handle warehouse fulfillment tasks, 3PLs need to find a way to run the same warehouse with their core people and still accommodate more demand and growth.

This raises the question of how to make existing workers more productive.

> How do you increase picking rates from 90 units per hour to 1,000 units per hour, a 10X improvement?

Today's warehouse technology helps workers execute tasks in a more efficient manner, and it helps organize all workers' tasks to be sequenced in a way that eliminates idle time.

Warehouse automation augments existing labor and helps fulfillment centers multiply the efforts of their workers. All of this helps 3PLs meet consumer demands, provide excellent service to their customers and capitalize on the opportunities of today's retail environment.

To help ask the right questions when assessing these investments, we'd like to share 5 key considerations to keep in mind:

# CHOOSE A SCALABLE & FLEXIBLE AUTOMATION SOLUTION THAT MATCHES YOUR PACE

For most 3PLs, it's critical to have a warehouse automation solution that is both flexible and scalable.

It needs to be flexible enough to adapt to and work within a facility's existing infrastructure and systems. It needs to be scalable enough to grow in parallel with the trajectory of the business and to adjust to meet peak season needs and fluctuating business demands.

The biggest barrier of entry for many warehouses is the cost for a warehouse automation solution, along with the necessary changes in infrastructure to accommodate it. Many automation and robotic solutions require significant upfront capital investments.

For businesses like 3PLs, which have time-bound agreements with their customers, it is important to be able to choose the level of automation investment and have the option to expand it over time.

Today, AI automation software can offer enormous productivity gains by optimizing warehouse workflows. If you are not ready to accommodate robots in your facility, choose a solution that lets you start with software and then scale up to robots.
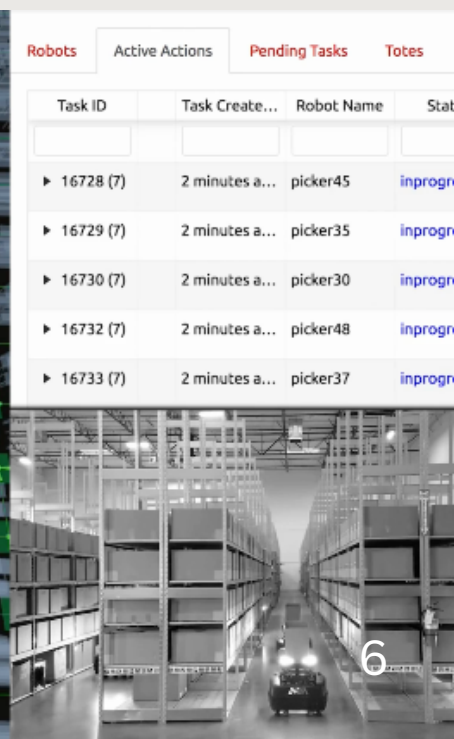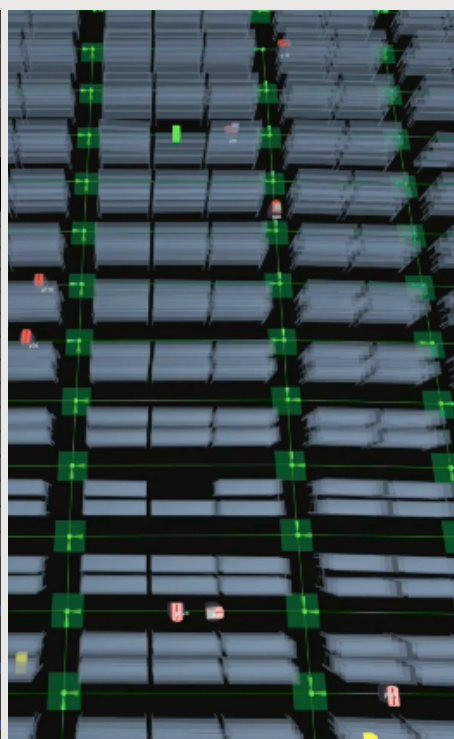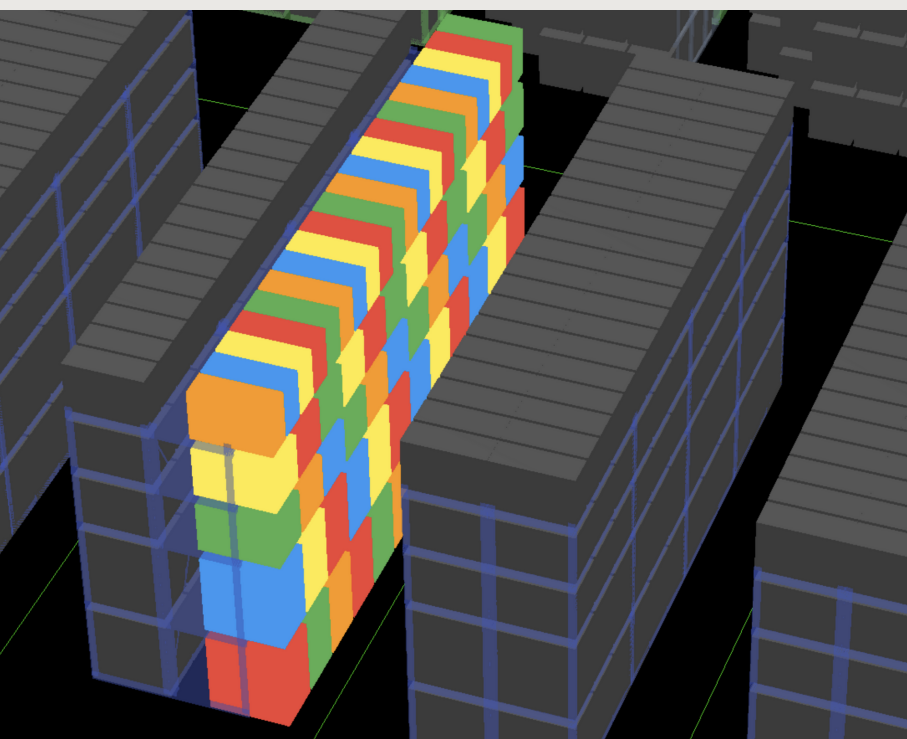
INVIA'S PHASED APPROACH TO TECHNOLOGY ADOPTION

inVia's automation solution offers AI-powered automation software alone and then an easy option to scale up to robotics.

With inVia's subscription-based model, the customer does not purchase the robots - they are owned and operated by inVia.
You can start with software automation (SaaS), then upgrade to Robotics-as-a-Service (RaaS) to realize even greater productivity gains.

The software digitizes and optimizes every fulfilment workflow, generating increased productivity by

2-3X

Adding robots boosts productivity gains by

5X
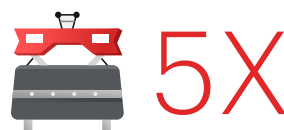
CASE STUDY

FROM SAAS TO RAAS: SHIPHERO FULFILLMENT AUTOMATION

ShipHero, a logistics platform for more than 5,000 eCommerce brands and third-party logistic providers, began a partnership with inVia Robotics in 2021 when they added the inVia Logic WES software to a distribution center in Jacksonville, FL.

inVia's intelligent labor orchestration and direction dramatically improved the productivity of their existing warehouse workers. ShipHero quickly decided to add robotic task automation services with inVia Picker robots to increase efficiency. It further expanded warehouse automation to additional distribution centers.

shiphero™

INVIA
ROBOTICS

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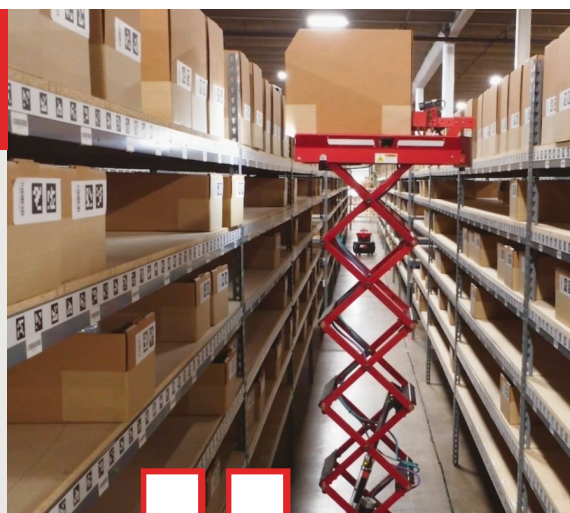
inVia's intelligent labor orchestration and direction was really successful in improving the productivity of our warehouse staff. We decided to add robotic task automation with inVia Picker robots first to our Jacksonville fulfillment center, then expanded the technology to include our Allentown, PA and Las Vegas, NV warehouses.

AARON RUBIN, CEO of ShipHero

PTG OR GTP? UNDERSTAND YOUR AUTOMATION OPTIONS AND CHOOSE WISELY

There are many types of warehouse automation technology choices available today. Generally, they fit into two categories: person-to-goods (PTG) and goods-to-person (GTP).

Many Autonomous Mobile Robots (AMR) solutions on the market are based on person-to-goods fulfillment and operate as smart carts powered by software. The order picker meets the robot at the pick site, removes items from the shelf, puts them into the smart cart, then each proceeds separately to another pick location. People walk less because they tend to concentrate on a warehouse zone, which means less foot travel.

Goods-to-person (GTP) is a warehouse automation solution in which products are brought to a person. When it comes to order fulfillment, Goods-to-Person can deliver greater increases in productivity because it cuts down on employees having to walk miles each day across expansive distribution centers. It significantly speeds up pick rates, reduces labor costs, and increases throughput.

Person-to-goods (PTG) order picking involves people going out into the aisles to select items.
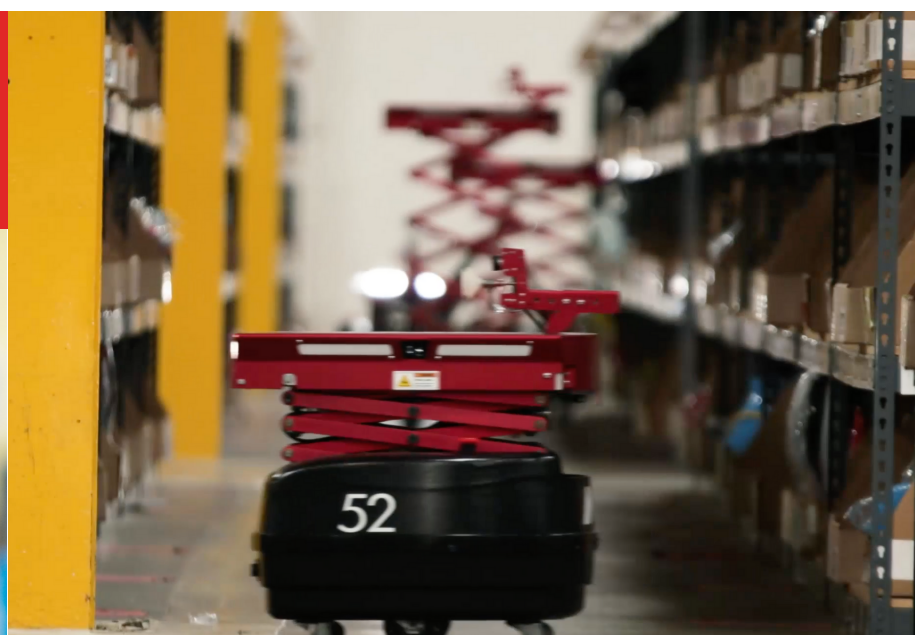
Goods-to-person (GTP) involves automation technology that brings the goods to the order picker.

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There are a variety of GTP technologies. On one end are large, fixed robotic systems like Automated Storage and Retrieval Systems (AS/RS), which deliver high productivity rates, reduce the amount of foot traffic for warehouse workers, and provide high storage density. However, these systems are expensive and require extensive construction projects within warehouse facilities, which is a considerable investment in infrastructure.

On the other end are mobile automation solutions, such as those offered by inVia, which use Autonomous Mobile Robots (AMRs). These warehouse automation solutions are more easily scalable and flexible.

There are two mobile goods-to-person automation approaches. "Racks-to-Person" GTP technology uses low-profile robots to go underneath an entire shelf of goods, lift up the shelving unit and carry it to an order-picking station. The disadvantage to a racks-to-person approach is that people and machines often work at different paces. Racks and goods can pile up while an associate takes a break.

inVia Robotics avoids these bottlenecks with a unique "Totes-to-Picker" approach. inVia Picker robots navigate the warehouse and autonomously remove a tote from the shelf. Later, picker associates pick items from the totes. inVia System reduces walking by 99.5% and virtually eliminates idle time. The system decouples human and robotic processes, allowing humans to work in bursts, while robots can operate tirelessly 24/7.

Racks-to-Person
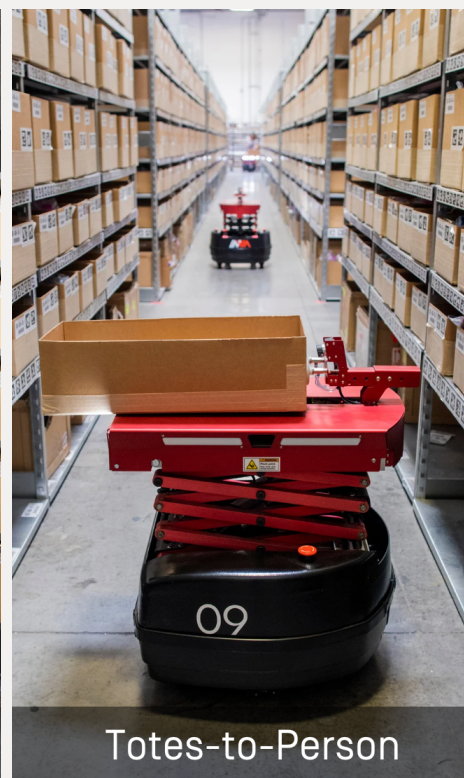
Totes-to-Person

There are a lot of different AMR solutions available on the market today. Ask your vendor if they are a PTG or GTP technology and how much the solution improves productivity or reduces the time and distance between each pick.

MINIMIZE CAPEX: AVOID LARGE INFRASTRUCTURE INVESTMENTS

3PL providers are eager to minimize their capital investment in warehouse automation and keep ROI high in order to deliver better pricing to their customers.

They want to steer clear of large infrastructure outlays because they can't justify amortizing the cost of capital-intensive systems over timeframes that exceed the life of the contracts they have with their own customers.

Many robotics solutions require some level of change and investment in your current facilities. The most expensive option, which entails the greatest changes, is AS/RS, which we discussed earlier. Even AMR solutions vary in terms of the degree of infrastructure changes required.

## Important questions to ask when choosing robotic automation:

- Can these solutions operate on your existing floors?
- Can they be deployed in both greenfield and brownfield operations?
- How much disruption is your warehouse going to be required to tolerate during the deployment process?

Choosing Robotics-as-a-Service (RaaS) is another way 3PLs can minimize CapEx. RaaS offers 3PLs a pricing model that lets them get the automation they need at an affordable cost of entry. inVia's subscription-based automation models keep costs under control since 3PLs don't need to buy hardware and they pay only for the productivity the system delivers.

MINIMIZED CAPEX AND NO CHANGES TO EXISTING INFRASTRUCTURE WITH INVIA ROBOTICS

inVia Robotics is a unique Goods-to-Person automation system that allows you to keep your existing infrastructure for both greenfield and brownfield operations. It offers a subscription-based model that minimizes CapEx and lets 3PLs pay only for what matters most: their warehouse productivity.
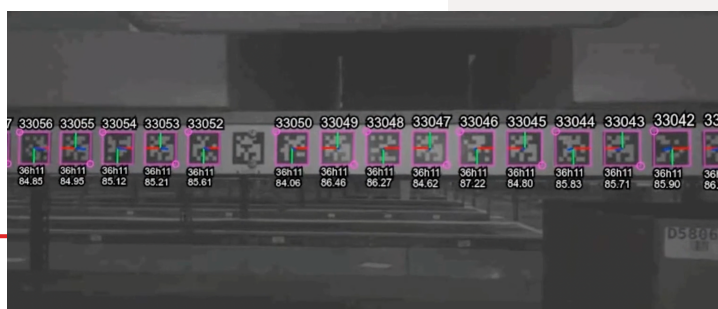
inVia Picker robots use patented machine vision solutions guided by fiducial stickers.
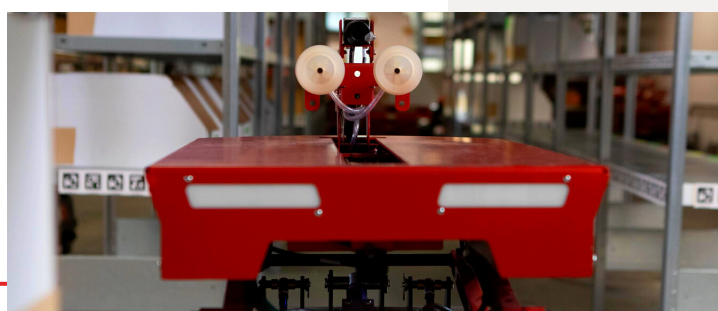
Warehouse owners can keep and use their own racks, simply adding the fiducials at designated points.

The robots detect the position and orientation of the stickers with ultra-precision, which helps them localize themselves and detect landmarks.

This capability translates to minimal investment, reliable performance and improved productivity. The solution causes less downtime and fewer errors on the warehouse floor.

BOOST PRODUCTIVITY
TO MEET YOUR SLAS

Today's consumers want unlimited options of products that are readily available at the click of a button. They expect direct delivery to their homes next-day or same-day. This translates into tighter SLAs on the warehouse floor.

This phenomenon puts added pressure on warehouses and 3PLs to adopt automation across their locations, to help drive productivity increases. They simply don't have enough workers to handle basic tasks such as order picking, managing returns and replenishing SKUs. The combination of automation paired with warehouse employees working smarter drives significant gains in productivity.

While all automation solutions provide increases in productivity, not all are created equal. You still need to balance the investment with the return.

Robotic solutions that offer the highest productivity boost provide end-to-end orchestration of fulfillment operations. They digitize and optimize core fulfillment functions from picking to replenishment to inventory management, and automate them with highly efficient robotics.

Today, software optimization using AI can rival the gains in productivity offered by some robotic solutions. Certain business profiles warrant starting there until volumes grow enough to warrant robots.

inVia's system starts with the SLA and then works backward to create and execute a daily plan that calculates every movement needed in order to hit the goal. As unexpected events happen throughout the day, it recalculates task assignments in order to meet the SLA.

inVia's WES software alone provides a 2-3x boost, which is comparable to some of the PTG robotic solutions on the market and a lot less costly. Adding inVia's Goods-to-Person automation allows for 5x increase in productivity compared to traditional picking.

When choosing robotic automation, it's worth considering the following to maximize productivity increase:
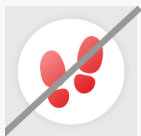
Does the system minimize or eliminate walking? In general, Goods-to-Person automation results in less walking as goods are brought to you, which results in a higher increase in productivity.

Is the system people-dependent? Even automation that offers the greatest productivity boost like AS/RS or "Rack-to-Person" GTP solutions interlock people and robot processes. If a person is not at the station, the robot is idle, which impacts productivity.

Does the robotic system handle other fulfillment functions such as putaway or replenishment? Your picking productivity is only as good as your replenishment. In order to see the full benefit of automation you need a system that orchestrates all fulfillment tasks to hand off efficiently.

inVia'a patented robotic automation system automates replenishment and putaway and aligns picking productivity with replenishment productivity, ensuring smooth and efficient order fulfillment. inVia's highly efficient system results in an average 350-400 UPH pick rate and can help realize bursts up to 1,000 UPH.

# OPTIMIZE SPACE UTILIZATION WITH INVENTORY MANAGEMENT

Retailers and 3PLs need sufficient warehouse space to store inventory and equipment, manage and move inventory, fulfill orders, and ship SKUs to customers.

Unfortunately, many warehouses and distribution centers may be outmoded, as they were built to handle business demands in a different time, without much leeway for expanding SKUs. Since the pandemic, surging e-commerce demand has led to an explosion in the number of different SKUs that must be kept on hand, squeezing warehouse capacity.

For many retailers, expansion of warehouses and distribution centers is not a viable option due to high real estate costs. It all comes down to inventory density, making every inch of space drive value and justify its cost to the company.

Adequate space needs to be allocated for receiving, storage, transit, assembly, picking, packing, and getting products out the door. Using compact storage solutions and vertical storage, such as shelving and mezzanines can significantly increase density.

Automation and AI-powered WES software can maximize the use of available space while still ensuring efficient operations through slotting optimization, system-driven replenishment and putaway, and smart inventory management.

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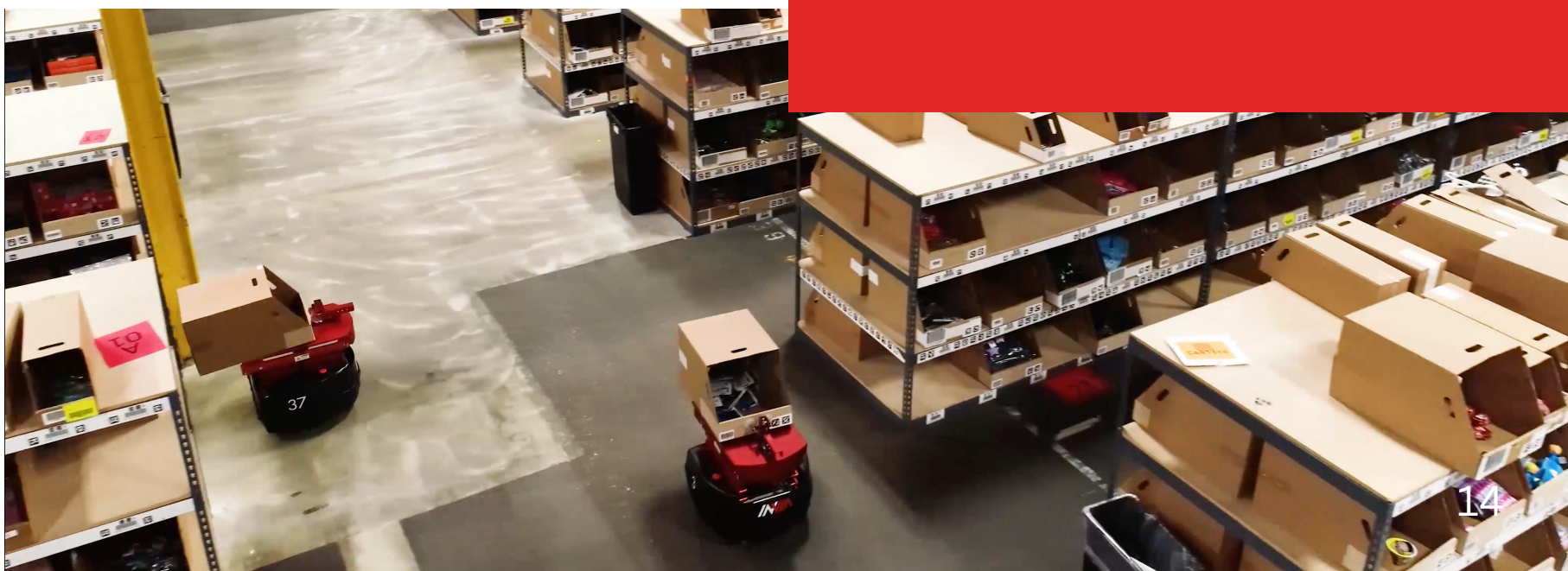
Automation tools can play a significant role in managing your existing inventory, improving warehouse operations and maximizing density. These density-enhancing features include:

1. Removal of empty inventory containers to minimize wasted space

2. Consolidation of partially filled totes to avoid single SKUs spread across several inventory containers
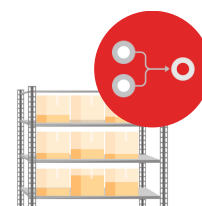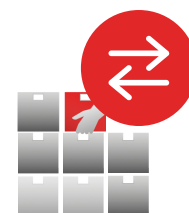
3. Consolidation of slow-moving inventory

4. Relocation of aging inventory

5. Re-slotting SKUs to the optimal locations in the forward-pick area

inVia Logic WES software's new density optimization tools help customers continuously identify and eliminate wasted space. The AI-powered software helps warehouse operators digitize their stock and processes to make each SKU visible in real-time. The system-driven replenishment, inventory consolidation and dynamic slotting optimization help each SKU to be optimally placed and dynamically moved to maximize warehouse density.

CONCLUSION

The explosion of eCommerce over the past few years has only magnified the importance of reliable supply chains and the need to deliver products quickly and accurately to discerning consumers. With retailers focused on driving growth in their core business, many are outsourcing shipping, deliveries and returns to third-party logistics providers. The question then becomes how well-positioned are 3PLs to take on this much larger role across the retail landscape.

To meet the continued surge in eCommerce shopping, third-party logistics firms need to scale, which puts pressure on their systems, facilities and resources. Scalability, rising costs, warehouse space, and attracting the right talent to run their operations are some of the more pressing challenges 3PLs are facing. To stay ahead of growing consumer demand, 3PLs need to drive efficiency across their operations. Modernizing their facilities through the use of AI-enabled automation is critical to keeping productivity high and meeting consumer demand.

Knowing you need to invest is one thing. Knowing the best way to invest in your operations is a much greater challenge facing many 3PLs. The key considerations to keep in mind when selecting an automation partner include an understanding of software and robotic automation options and the impact they have on infrastructure, productivity, and space optimization.

Here are some of the factors warehouse operators should take into account in assessing their warehouse automation options:

1. Can the solution scale with my business and operate within my existing infrastructure?

2. Does it augment existing labor and improve worker productivity?

3. To what extent does the technology minimize walking?

4. Is the system people-dependent? Does it decouple human and robotic processes, allowing people and robots to realize their full potential?

5. Does it require large infrastructure investments?

6. How long to deploy and what kind of downtime could this solution create?

7. What level of control do I have to dictate my desired level of automation?

8. Does it handle other fulfillment functions such as putaway, replenishment, or inventory management?

9. Does it eliminate wasted space and maximize density in both storage and forward pick locations?

Phased Approach to Automation

inVia Robotics is well-positioned to help warehouse operators improve productivity and incorporate automation software into their facilities.

Often, inVia will implement inVia Logic WES modular software to integrate with a customer's Warehouse Management System to boost worker productivity, improve workflows or help automate existing operations.

Once customers realize efficiency gains from software solutions, they can evolve to inVia's autonomous mobile robots to add task automation services and realize even greater productivity gains.

"We liked that inVia is able to segregate the hardware from the software. We're implementing the software first, then it's a light lift to gain optimization from the warehouse execution system. The addition of robotics simply pushed the efficiencies we realized through the roof. The combination of CAPEX, scalability and speed was unrivaled."

Kyle VanGoethen
Head of Network Planning, Stord

inVia Robotics is an award-winning automation company that provides the next generation of warehouse optimization solutions. Our system leverages AI-driven software and autonomous mobile robots to help e-commerce businesses and 3PLs optimize and automate material flow across fulfillment centers.

We deliver our comprehensive automation services as a subscription and with options to use the software to optimize existing labor or to add robots to augment workforces. Our systems are built to deploy quickly and without disruption to existing operations. The results are up to 4-5X increases in productivity and accuracy rates of 99.9% - all at a fraction of the cost of traditional automation. Learn more about how we can optimize your operations at www.inviarobotics.com.

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