



White Paper Series

The 5 Catalysts for Automation Transformation in Manufacturing and Distribution

Topic 1: Labor Shortage



Robots to the Rescue: How Material Handling Battles Persistent Labor Shortages

Material handling has undergone significant stress over the last few years, but the current crisis predates the pandemic. Most operations are still heavily-reliant on labor-intensive technology from the last century. With warehousing footprint expanding exponentially, now is the time to explore modern, flexible material handling automation to help respond to industry headwinds. This five-part white paper series explores each major catalyst for change in manufacturing and distribution, details their operations challenges, and covers how automation can help you overcome those headwinds and turn your response into a competitive advantage.

You don't need a Magic 8-Ball to see that labor shortages have crippled supply chains over the past few years. A swirling mass of trends have converged to create an unprecedented crisis for companies looking to stay competitive and profitable.

A global pandemic that reduced an already understaffed labor force in warehouses, fulfillment centers and factories around the world, as workers stayed home or looked for different opportunities. In July 2021, warehouse and transportation companies had [a record 490,000 openings](#).

Surging demand in e-commerce orders from at-home customers who couldn't or didn't want to shop in physical stores during the pandemic, but then [continued to stay online](#) after they discovered the convenience of ordering and options such as contactless delivery, curbside pickup and other retailer initiatives.

Turnover in an industry where rising wages from competitors forced companies to spend more money to attract and retain employees who could show up for work and then quit a week later.

["The Great Resignation,"](#) in which employees felt empowered to just quit their jobs rather than be forced to return to work in an office or at a warehouse where they felt underappreciated or experienced poor working conditions. In November 2021, the number of people in the U.S. who quit their jobs reached a record high of 4.5 million.

[Changing demographics](#) on a global scale where [the workforce is getting older](#), and younger workers are choosing to not go into several industries seen as "dirty" or "dangerous." According to the U.S. Census Bureau, in 2034 people over the age of 65 (77 million) will outnumber children under 18 (76.7 million) [for the first time in U.S. history](#).

Robots and Automation are Key

Robotics and automation within warehouse and factory environments are the only viable option for companies looking to **address critical labor shortages and optimize their operations** to handle surging customer orders. Thanks to innovations in computing performance, artificial intelligence and autonomy software, as well as lower-cost lidar and radar sensors caused by the development of self-driving cars, robot companies are developing hundreds of different robotic systems that can help companies with their operations needs.

While many enterprises understand the need for automation to solve these issues, the breadth of technology choices and different processes being automated can be overwhelming at first. Many companies often don't know where to begin their automation journey, or they get locked in or enamored with capital-intensive, custom-build warehouse automation overhauls that end up taking a long time to deploy and end up being more expensive in the long run.



In recent years, advances in autonomy technology have helped robot makers create more flexible systems than those from the past,

such as automated guided vehicles or fixed automation systems that have limited flexibility. Autonomous mobile robots (AMRs) for example, utilize smarter artificial intelligence software that lets them safely avoid obstacles in a warehouse, allowing companies to deploy them without having to redesign an existing warehouse or invest in expensive infrastructure. This has resulted in successful robot deployments for many companies, including DHL, FedEx, and Wal-Mart, among others.

Companies can benefit from flexible materials handling automation that offer faster return on investment while also letting them tackle specific processes within their warehouse where their labor shortages are the most critical. This can set the stage for a larger automation strategy in the future where multiple processes and tasks are integrated to create even more automation.

Before companies can explore different technology options, they need to understand the key reasons why automation is the answer to their problems. **Here are five solid reasons why material handling automation can overcome labor shortages within factories and warehouses:**

Reason 1: Robots Supplement Understaffed, Underperforming Operations

It's fully understood that companies exploring robots and automation are not looking to replace their workforce with robots that do the exact same job. The old arguments about "robots killing jobs" failed to understand how robots are used to augment an existing workforce to help make their jobs less dangerous, less mundane, and more efficient.

A report in 2019 by Daron Acemoglu and Pascual Restrepo suggests that while automation does reduce labor for some tasks, "the effects of automation are counterbalanced by the creation of new tasks in which labor has a comparative advantage." **It's the balance between replacing a mundane task with automation that can generate new tasks or jobs for humans in which humans have an advantage.**

Another example cited in this Brookings report is how the introduction of computers into offices did displace millions of secretaries and typists, but "the new tasks in associated industries meant new occupations, including computer technicians, software developers, and IT consultants."



In 2018, the Association for Advancing Automation (A3) said the period between 2010 through the start of the pandemic saw the greatest expansion of robot usage, yet unemployment dropped from almost 10% to under 4%. "We've looked at this over a 22-year period, and now **in every period where robot sales went up, unemployment went down in the U.S.,**" says Jeff Burnstein, president of A3. "So it doesn't look like a job killer. It doesn't act like a job killer. Because it is not a job killer."

Source: CSIA Exchange

That said, there are some truisms about the ability of robots to act as "labor" in terms of being similar to full-time employees or temps. Robots often come fully trained and are available for every shift, they don't call in sick, and can operate 24/7 for the most part (apart from battery recharging time). New skills and "training" for robots can be accomplished through over-the-air software updates, and many robot systems become smarter through their lifespan as they employ artificial intelligence algorithms to find new delivery routes or ways to optimize their tasks.

Reason 2: Automation Combats Employee Turnover, Reduces Training Time

Because robots aim to augment a company's workforce instead of replacing them, employees who work with robots end up being more engaged in their jobs than before. The "Great Resignation" revealed that many people want more out of their jobs, and companies are understanding that employee retention tends to be higher once they've deployed robots and other automation technologies.

First, many of these robots are able to perform the dull, repetitive and often labor-intensive tasks found in warehouses. This includes walking miles per day, picking orders, or manually pulling carts filled with heavy items. By not having to do many of these tasks, employees find themselves more engaged and able to become more productive by allowing them to focus on human-centric abilities such as decision-making and problem solving.

Many robots developed for warehouse environments include intuitive user interfaces or user experiences to engage human workers. This also includes gamification options that provide incentives and positive reinforcement through their workday to help keep employees happy. Giving workers the ability to work with high-tech, cutting edge technologies can turn them into "robot wranglers" instead of just being a "warehouse worker."

Many companies are also discovering that training an employee to use a mobile robot takes less time and effort than having them learn a manual, repetitive and ultimately non-interesting job. In 2018, a survey of warehouse operators found that once workers are hired, [less than 29% said they could bring a worker up to speed in less than a month](#). Keeping employees interested at the start of their career prevents longer-term and more expensive problems in hiring and training down the road.

< 29%

Percentage of new warehouse workers fully operational in under a month

Reason 3: Robots Can Lower Operating Costs

Wages for human workers continue to rise within the warehouse space. From \$10 to \$12 per hour a few years ago, wages jumped to [\\$15 to \\$17 per hour](#) before the pandemic, to \$20 to \$22 per hour now. Companies like Amazon and [Walmart](#) continue to spend money [heavily recruiting workers](#), offering sign-on bonuses and other non-cash benefits such as tuition/career assistance, health insurance, [upskilling training programs](#), and more.

As the performance of automation continues to improve, the costs for operating a robot continues to shrink. Costs can be as low as \$5 per hour for a robot, or even a few pennies per pick in some order-fulfillment tasks and processes.

In some cases, companies can achieve an ROI in as little as two to three years, while others often find instant savings. Automation can often pay for itself even faster when companies understand the costs involved in understaffing and turnover issues versus having a consistent labor force than having to repeatedly hire employees who then quit after two weeks, or even fail to show up at all.



Reason 4: Automation Enables More Flexibility, Scalability



It's clear that companies can no longer just throw bodies at their warehouse and factory labor shortages – the labor just isn't there, hiring cycles are too long, and wages and bonuses continue to skyrocket. Continuing down this road will only lead to more money being thrown into a bottomless pit, and orders will continue to be delayed with fewer workers available.

The beauty of modern flexible automation systems, including autonomous mobile vehicles, is that they can be reconfigured and scaled up as needed depending on operational demands.

Business models such as robots-as-a-service, where companies rent or lease equipment on an as-needed basis, allow for operational expenses to be used instead of costlier capital expenses. This also eliminates the need to maintain and manage equipment, reducing additional costs.

This flexibility also offers companies the chance to expand to new facilities faster than with a capital-heavy, rigid warehouse automation approach that utilizes conveyors that are bolted to the ground with limited options for expansion.

Reason 5: Robots Increase Efficiency, Optimizing Operations

In many cases, companies that deploy flexible automation and robots become more efficient in their operations through their material handling or order fulfillment tasks. For example, in situations where robots are used to deliver e-commerce orders to a packing station, AI software can be used to optimize the delivery route a robot takes, with higher-value orders filled faster, or high-volume orders being placed closer to packing stations. With employees seeing the benefits of using robots in their jobs, this in turn improves their productivity.

This combination of robot efficiency and engaged employee productivity creates a situation where many companies can “do more with less” through the smart integration of flexible automation.

A third benefit appears when companies realize that they can now operate longer hours due to the automation capability, operating 24/7 with minimal staff, creating even more productivity outcomes and reducing productivity “spikes” that often occur with short-staffed operations.



Next Steps and Conclusion

As you can see, there are some fast benefits for companies that deploy flexible automation solutions that address specific task and process needs to address critical labor shortages in warehouse and factory environments.

The best way to get started is to pick the easy problems that are at the fulcrum of your labor challenge. These are often repeatable workflows that involve a lot of square footage to cover in your facility. The further the distance of the work performed, the faster the ROI of any material handling autonomy project.

Keep in mind, robots work differently than humans. You will need to adapt your processes to ensure that robots are most effective, and you may need to modify upstream and downstream processes as well. Trying to retrofit or customize an autonomous solution to do everything that you do today could be a fool's errand and, oftentimes, results in overly complex engagements that experience delays and produce unreliable outcomes.

Before you begin, however, understand your operational pain points, and where quick gains can be achieved. Match those pain points with available resources from automation providers that can offer a quick ROI and "easy wins" to help provide operational efficiency improvements while also addressing labor shortages.



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