



White Paper Series

The 5 Catalysts for Automation Transformation in Manufacturing and Distribution

Topic 4: Reshoring





Build Back Better with Bots: Why You Need Automation as the Centerpiece of Your Reshoring Initiative

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.

Severe supply chain shortages over the past few years are the latest challenge that highlights the need for U.S. discrete manufacturers to locate their production facilities closer to their customers. Global crises such as COVID-19, the Russian invasion of Ukraine and increasing lead times in China have exposed the flaws inherent in the idea of offshoring and just-in-time manufacturing processes.

Additional factors such as consumer demand for immediate delivery of ordered items, the growth of customization options for products, surging energy costs, increased corporate goals for sustainability to slow the effects of climate change, and persistent challenges to find skilled labor are putting even more pressure on companies within the automotive, high-tech, medical device and aerospace sector to look for solutions.

For an increasing number of manufacturers, reshoring or nearshoring – moving production facilities from overseas to countries in North America – looks to provide answers to address several of these challenges. In addition, adopting flexible automation and robotics within some of these new facilities can address the challenges of labor shortages and

the need to support small batch, high-mix manufacturing models. The combination of both a reshoring/nearshoring effort along with a flexible automation strategy to address labor challenges and customization demands is the approach many companies need to remain competitive and less dependent on global events that can handcuff a company's supply chain.

Mounting evidence on reshoring movement

Even before the global pandemic cast a shadow on flaws within the supply chain, companies were exploring the possibility of reshoring their manufacturing facilities. In a 2019 survey by the Reshoring Institute, close to 7 in 10 companies cited international logistics costs as the top reason for considering reshoring. The biggest issue for companies that sourced from overseas included latency and delays in shipping, and production schedule delays, along with inconsistent quality.

More recently, a survey of 1,610 executives in the U.S. and Europe found that 70% of U.S. businesses are planning changes in their operations, with 37% planning to bring

production back home, and 33% looking to nearshore and shift operations to a closer location.

The same ABB study also showed that 43% of businesses surveyed plan to expand robotics and automation to address supply chain concerns and address customer demands.

Research and surveys from other sources indicate a general upward trend in the reshoring and nearshoring movement, including:

- [A survey by Site Selection magazine](#) showed that 71.5% of those surveyed said their clients were now considering more reshoring projects, compared to only 4.1% considering new international locations. “For every one respondent who said clients were considering new international locations, 17 said clients were reshoring.”
- 45% of businesses surveyed are moving their supply chains closer to home. In another study, about 90% of businesses surveyed [plan to regionalize their supply base](#) over the next three years.
- The Reshoring Initiative said [more than 138,000 jobs](#) were projected to return to the U.S. in the last year, with 1,334 companies expected to reshore. The group estimates that 860,000 jobs have been hired, representing 78% of the 1.1 million increase in U.S. manufacturing jobs since February 2010.
- **Nearshoring:** Out of the 32 companies (4,131 jobs) that nearshored to Canada, 86% of them came from Asia, and 14% came from Western Europe; Out of 146 companies that nearshored to Mexico (44,631 jobs), 80% came from Asia, and 20% moved from Western Europe.
- Walmart announced [an investment of \\$350 billion in U.S. manufacturing](#), sourcing products such as textiles, plastics, small electrical appliances, food processing, and pharmaceutical and medical supplies.



Five Ways that Flexible Automation Can Facilitate Reshoring

While several challenges still exist – reshoring is still a complicated and lengthy process and American companies cannot simply just flip a switch to relocate their supply chains – the past few years of supply chain shortages and disruptions have awoken companies to realize the benefits of having suppliers and manufacturing facilities closer to customers. These same manufacturers are also realizing they cannot try and copy what other overseas offshoring countries have accomplished, but need to adopt new technologies and strategies to remain competitive.

“American industries are not going to compete with overseas factories by manually building product faster,” says John Sheff, director of public and industry affairs at Danfoss, a supplier of industrial power and drives technologies. A lack of workers and square footage to replicate overseas, in addition to workers not accepting lower wages or a reduced standard of living, [make such a recreation impossible](#). “The only way for us to compete globally is to out-innovate and out-perform our competitors,” says Sheff. “If we can shorten supply chains and use domestic suppliers with proximate inventories, our industries will be able to maintain less capital, become more efficient, and decrease transportation costs.”

Because reshoring is occurring almost always from low-wage countries, [reshoring companies have increased automation](#) to make up for higher domestic hourly labor cost. For example, American robotics producers that were concerned about Chinese supply disruptions [shifted their sourcing of key components](#) to Taiwan, Israel and the U.S.

The opportunity for manufacturers to utilize robotics and automation is huge – [fewer than 10% of American manufacturers have any industrial robots](#). And given that integration costs and finding skilled workers are often cited as some of the biggest hurdles into robotics adoption, flexible automation has a key role to play in increasing adoption.

#1: Automation reduces reliance on labor while improving quality and the bottom line

In September 2021, U.S. manufacturers had 897,000 open positions, representing 7.2% of all manufacturing jobs. (BofA Securities Global Research report, Bureau of Labor Statistics). As labor shortages persist across the industry and wages continue to rise, flexible automation like AMRs and cobots allow manufacturers to supplement these understaffed tasks with collaborative robots.

Companies that have deployed automation have discovered that it not only addressed labor shortages, but it improved the efficiency of operations by delivering consistent task and cycle times. This allowed companies to “do more with less” by focusing their scarce labor resources on higher-value tasks.

“Customers buy robots thinking to become productive, but then discover that the biggest change is greater quality and reliability in their operations,” [an MIT report on robotics’ impact on jobs](#) stated.

Flexible automation processes also allow for smaller facilities to produce more for local markets rather than constructing a megaplant that serves the entire nation.

#2: Automation and robotics help retain an existing workforce

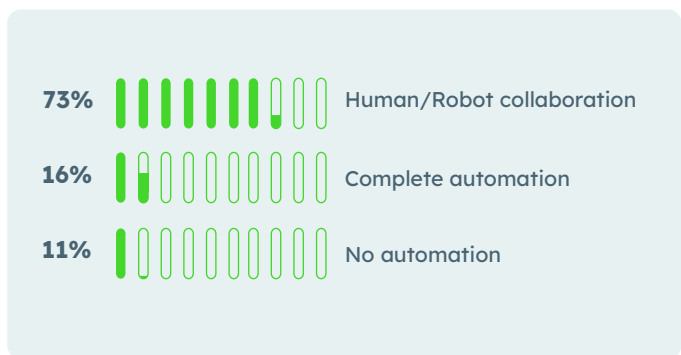
By letting workers focus on less mundane work and improve the overall engagement and safety, many companies believe automation helps them retain workers. In a recent study, 70% of executives said they [plan to increase their automation investments](#) because of this retention capability.

Additional evidence suggests that having robots and humans working together in more collaborative settings (instead of just replacing a human manual task with a robot) results in better optimization.

For the right application, human-robot teams can be up to [85% more efficient than humans or robots working alone](#).

Companies are exploring the purchase of collaborative robots (often referred to as ‘cobots’) to help with this human-robot interaction. Cobot purchases increased from 35% of all robot sales in 2019 to more than 56% in 2021, [according to a survey conducted by Automation World](#).

[In a Zebra study of warehouse automation initiatives](#), 73% of respondents said the most optimal balance in warehousing includes human automation, either through partial automation or augmentation (equipping workers with devices). Only 16% said full automation (no workers) was optimal, and even fewer (11%) said no automation (all manual) was the best outcome.



#3: Flexible automation can adapt quickly to changing operations

Traditional industrial automation that used large robot arms, such as in the automotive industry, relied on purpose-built machines for specific applications and tasks. These robots need to be recommissioned or new processes need to be engineered should lines change or new products are introduced.

Flexible automation is defined as the ability to adapt as new lines get tooled, or as workflows, layouts and processes change. Companies looking to shift from low-mix, high-volume production to high-mix, low-volume production processes to adapt to changing consumer demands will require a more flexible automation system.

An example of this can be seen by autonomous mobile robots (AMRs) that can quickly and easily change their routes as a plant layout changes and new lines come online. Features such as obstacle avoidance and dynamic route planning can help ensure timely delivery, even as conditions on the floor change.

Other examples include bin picking robots that can learn how to handle new objects and improve their picking rate over time, as well as new low-code programming interfaces that allow for the rapid repurposing of robots. Many cobot arms can now be installed without needing safety fences or permanent infrastructure, with advanced sensors that can slow or stop a robot if a human gets too close to them.

Software-driven automation allows companies to rapidly repurpose and reconfigure their deployments should conditions change. In addition, performance of robots can be improved via over-the-air software updates that enable greater agility and continuous improvements on the hardware.

#4: Automation and robotics enable companies to scale faster

Traditional automation approaches that include a fixed output typically take between one and three years from the start of planning to a full installation, and often include large, upfront capital purchases.

More flexible automation approaches, which often include operational expense (OPEX) models or robots-as-a-service (RaaS) scenarios, allow companies to implement and scale up faster than having to wait for capital project approvals. Installation is also much faster, as there are no massive infrastructure changes needed. Many flexible automation systems can be installed in weeks, and can be reconfigured and scaled up or down as needed.

For example, many e-commerce warehouses and third-party logistics providers that deploy AMRs and other mobile robots find flexibility in being able to increase their robots during the peak holiday season, and then scale down those deployments when peak season ends. Many often then redeploy those robots to handle product returns and restocking processes, further extending the value of the robots.

Because flexible automation solutions are easier to relocate and expand to new facilities, this also means factories can move away from fixed assembly lines, and more towards a modular manufacturing model for producing the high-mix, low-volume demands, as well as explore mass customization scenarios.

#5: Automation improves visibility and drives continuous improvement

Automated systems include software features that can track parts and assemblies down to the individual component and process step level. This enables systems to automatically flag quality assurance issues, giving companies the ability to pull out products for rework or re-routing, or re-prioritizing tasks to still execute on the optimized plan via intelligent orchestration.

In addition, the advanced analytics and vast amounts of data that are produced by robotics systems can be used to optimize a factory layout and provide further insights on a company's operations.

Here's an example of how this can work. An AMR is currently feeding products to three parallel work cells in a factory. The AMR initially planned to replenish Cell 1, but the robotic cell detects and issues and knows it will take longer to complete the task. The system alerts the AMR conditions have changed, and the AMR reroutes to Cell 2 which will now complete its work before Cell 1. On the way to Cell 2, the AMR needs to avoid an obstacle and logs it in its system, which shows up on a heatmap of the factory. Operations staff use this information to adapt the AMR paths to avoid that area for future deliveries.



Conclusion: Flexible Automation Can Provide a Competitive Advantage

Manufacturing and distribution operations that can move their facilities to be closer to end customers can become more responsive, adaptable and resilient to global supply chain disruptions.

While we don't believe that companies will completely eliminate their offshoring strategies for specific product lines, we do feel that companies that explore reshoring and nearshoring opportunities will gain a competitive advantage over other companies that continue to rely solely on overseas suppliers.

Flexible automation solutions that include robotics of all types to help workers become more productive and efficient in operations, can provide companies with the push they need to overcome some of the reshoring challenges.



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