

A collaboration between people and automation has tremendous value to the workforce. Autonomous mobile robots are becoming a great asset to the workforce, and robot expansion will not be going away for the foreseeable future.

The Future of Work in Manufacturing Will Be Built on the Optimization of People and Robots

September 2023

Written by: Roderick Gaines, Research Director, Worldwide Supply Chain Strategies: Warehousing, Inventory, and Order Management

Introduction

For the manufacturing and warehouse industry, there are millions of jobs that continue to be left unfilled, which leaves equipment, factories, and warehouses underutilized and facilities falling short of their operational effectiveness goals. How bad is it? According to IDC's recent *Supply Chain Survey*, 73% of manufacturers have or will increase hourly wages to retain/attract talent as a method to overcome chronic shortages. However, that does not fix the problem in the long term and functions only as a band-aid in the short term. The lack of advancement and the concurrent retirement of older, skilled professionals and individuals that don't want to complete this type of work are contributing factors to this problem.

Manufacturers are looking for ways to better manage their workforce challenges, and many are turning to automation to create a blended workforce. Indeed, the collaboration of people and autonomous mobile robots (AMRs) has many advantages. AMRs are not replacements for people or jobs; rather, AMRs can replace tasks, augment people, and provide both tangible and intangible value to the manufacturing and warehousing industry. This use of automation is a clear trend as over 84% of warehouses and factories have some type of material handling or robotics equipment.

As companies integrate automation into their operations, previous work models are shifting to be more adaptable and scalable. Using automation will become a significant element of the workforce in both the warehouse and factory, freeing up team members to tackle more value-added tasks. This has the dual benefit of making existing workers more effective and making the jobs more appealing for future hires.

AT A GLANCE

KEY STATS

According to IDC research:

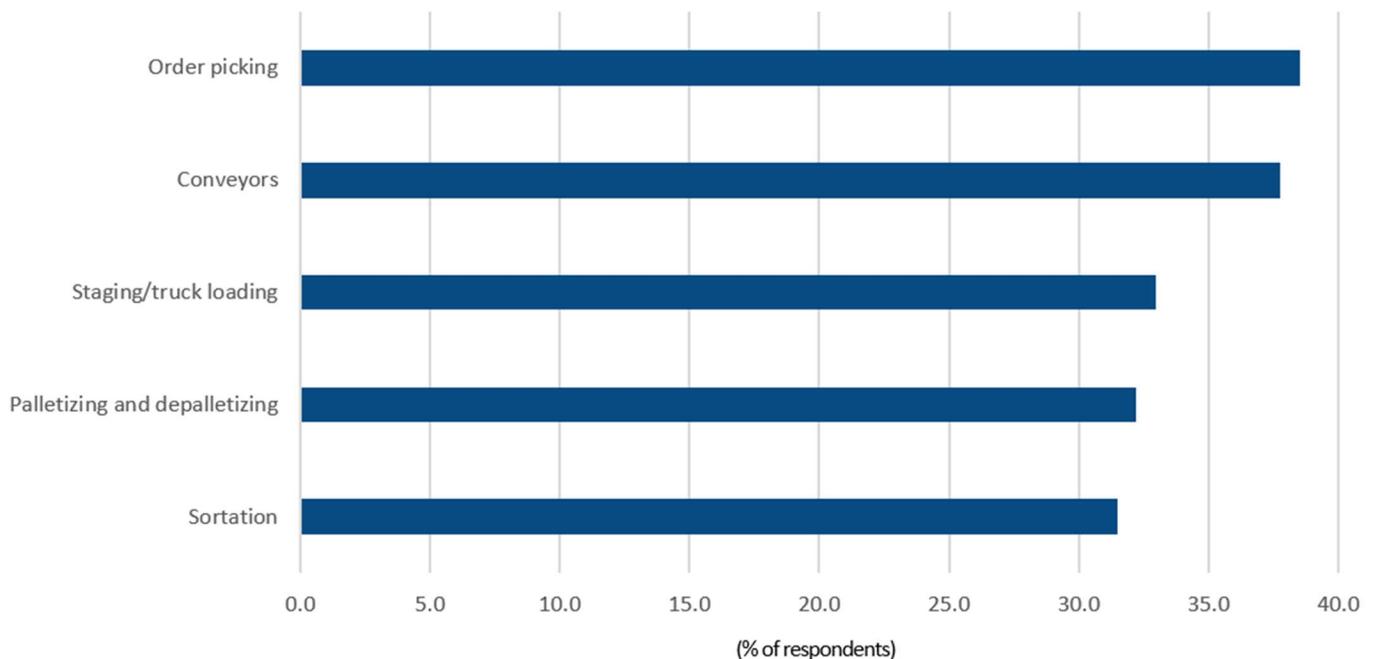
- » Over 71% of companies are currently deploying or planning to deploy material transport automation in their distribution and factory facilities.
- » 44% of companies that indicated that robotics are an important technology to their operation today are considered best in class or slightly better than their peers.

In IDC's recent *Supply Chain Survey*, respondents were asked about the role that mobile robots can play or will play. The results indicated a broad range of opportunities (see Figure 1). Largely, these opportunities focus on tasks that are repetitive, thus improving both efficiency and safety by, for example, reducing the incidence of injuries.

Companies are deploying numerous types of automation to assist their manufacturing operations. Order picking and conveyors were top choices for manufacturers. However, staging, truck loading, palletizing, and sortation were also top selections among manufacturers.

FIGURE 1: **Autonomous Mobile Robotic Deployments**

Q Where are you currently deploying or planning to deploy robotics in your facilities?



Source: IDC's *Supply Chain Survey*, March 2023

Autonomous mobile robots is an area of technology that is quickly changing the landscape in which businesses operate factories and warehouses to increase productivity, enhance operations, and maintain competitiveness. Indeed, companies that do not take advantage of mobile robots may find themselves falling behind.

In effect, it is time to get acquainted with robots.

Key Trends Driving the Use of Automation and Robotics

Over the past two years, across multiple IDC surveys, we have seen a common refrain as it relates to people resources, automation in general, and mobile robotics specifically:

- » 63% of companies are experiencing labor shortages in the warehouse and factory operations.
- » 43% of manufacturers say that improving worker health and safety, reducing incidents, reducing dependency from manual work, or improving workers' productivity is driving technology investment in factory operations.
- » 73% of manufacturers have or will increase hourly wages to retain/attract talent as a method to overcome talent issues.
- » 66% of manufacturers will automate jobs/roles to reduce the total number of employees required to operate.
- » 22% of manufacturers will increase reliance on physical automation/industrial robots to mitigate existing factory/operational issues.

Blended Workforce: Optimization of People and Robotics

The manufacturing industry is under pressure to respond to the ever-changing market needs. This requires thorough labor planning for the entire manufacturing operation. When companies think about labor, they tend to focus on employees versus automation in the context of cost. However, instead of companies focusing on the cost of labor, they should consider the value proposition that automation and people provide when working in collaboration — a blended workforce in effect.

Companies must recognize the unique strength of the collaboration of people and robotics. Manufacturing workflows are faster, more efficient, and more cost effective when people and robotics work together. A high-priority value that is rarely discussed among leadership is accelerating the time to expertise that automation provides. Manufacturers are finding it difficult to fill positions because they are not finding enough people for the job. However, other companies have also indicated that even once they find employees to complete the task, they then must train the employees as well. Finding talent is great but without the proper experience the learning curve can become overwhelming. Automation has shown it can function well as a training aid. For example, it can provide real-time assistance by leading employees to a particular station on the assembly line, shop floor, or inventory locations within the facility. Automation can also provide additional information regarding parts or materials that require special handling that may not be readily known by new team members. Simply put, manufacturers that implement automation in their environment can reduce the learning curve or training time required to get staff properly trained.

Automation also brings an entirely different layer of operational effectiveness. With the collaboration of people and robotics performing tasks together, managers can now shift repetitive and dangerous tasks such as heavy lifting or retrieving inventory to robotics while promoting health and safety and establishing an ergonomic work environment. But first, companies must redesign job roles and responsibilities so that there is a clear understanding of roles and responsibilities among employees. Rather than viewing automation as a direct replacement to staff, companies should envision people and automation as partners looking to achieve a common goal — namely, the success of the operation. By allowing automation to focus on repetitive and mundane tasks, staff can now shift their attention to work that requires critical thinking and creativity.

Increased efficiency and productivity are most companies' primary objective, and the collaboration of people and automation offers that. People and automation promote higher levels of efficiency, greater assurance of quality, and the minimization of errors as compared with the employee working alone. Because of work distribution and optimization, this use of automation leads to increased satisfaction and enthusiasm for work. This proposition is valuable as 43% of manufacturers say that improving worker satisfaction, health, and safety while reducing dependency on manual work is driving technology investments in their facilities.

Industrial Automation/Robotics Technology on the Factory Floor

IDC believes that the manufacturing industry is entering the next era of opportunity known as "Industry 5.0," which has many advantages for automation and people. As technology continues to grow and become more defined, so do the breath of opportunities for those technologies. Historically, manufacturing and warehouse operations have moved through four distinct stages, with a fifth beginning to take shape. While stages 1-3 focused on mechanized production, mass production, and the beginning of the digital era, the more recent stage 4 revolution focused on the use of factory systems, with each stage extending and expanding upon its predecessor.

The primary opportunity of Industry 4.0 was to connect factories. It provided a road map to create production systems where machines can govern themselves through interconnection, machine learning, and real-time data by utilizing smart technologies. All of this was made possible by components such as the Industrial Internet of Things and position-detecting sensors. Machines can now sense, scan, and store data. If Industry 4.0 is focused on automation, then the opportunity for Industry 5.0 is to focus on and provide a strong emphasis on the blending of people and automation.

The higher emphasis on collaboration between people and automation distinguishes Industry 5.0 from Industry 4.0. Rather than limiting staff productivity and depending too heavily on robotics, Industry 5.0 aims to combine people with automation. Industry 5.0 adheres to two fundamental principles: support staff rather than replace them, and achieve the ideal balance of efficiency and productivity.

The collaboration of people and AMRs are one of the primary components that will see Industry 5.0 achieve its main goal. AMRs can work next to staff in the same space and perform different tasks, or they could work with people on the same task simultaneously. The premise and potential for people and automation exemplifies Industry 5.0's core value, which is to concentrate on the outcomes that both employees and machines can provide.

There is not much of a gap between Industry 4.0 and Industry 5.0. Because of this, some people dispute the idea that Industry 5.0 is a separate step from Industry 4.0. However, Industry 5.0 is still in the early stages of development. Every step of the industrial revolution builds on the stage before it while borrowing from it. Everything that Industry 4.0 has — including connectivity, robots, the Industrial Internet of Things, and cloud computing — is still present in Industry 5.0. However, while Industry 4.0 concentrated on tying everything together, Industry 5.0 will take everything and concentrate on how it might be integrated to support employees rather than replace them.

Over 70% of businesses stated that improving operational efficiencies and sustainability is their top business objective for the upcoming 12 months and that the blending of people with robotics is a significant opportunity. Indeed, it's not just people or just robotics but the blending of both in which the whole is greater than the sum of its parts.

Considering Zebra Technologies

Organizations worldwide have come to depend on Zebra Technologies' products such as barcode printers, scanners, RFID, and mobile computers for their day-to-day operations and year-to-year successes. Now, Zebra has expanded its offering to include robotics automation solutions.

Zebra Robotics Automation, as part of the Zebra brand, is designed to power productivity in labor-intensive businesses, including manufacturing, warehousing, and distribution so that the facility space can be used more efficiently and workers can focus on higher-value tasks. Its core offering is a flexible, scalable, and fast-to-deploy AMR solution that brings cloud-based software together with advanced robotic hardware for smarter automation of material handling workflows.

Zebra's cloud-based software, with drag-and-drop workflow building capabilities, enables out-of-the-box automation so that material handling workflows can be deployed in less than 72 hours with no changes to the existing IT infrastructure. Highly versatile, a single Fetch AMR can perform a wide range of tasks and can easily be reassigned to a different task when and where needed.

In addition to an outright purchase option, the company offers robots as a service (RaaS), which gives organizations a cost-effective and accessible way to bring automation into their operations. Zebra Robotics Automation solutions are available through a network of mobile robotics specialization partners as well as direct channels.

Harnessing the power of both technology and people, customers report exponential improvements in key performance indicators including a 300% increase in production capacity, a 33% increase in space efficiency, and the reduction of manual material handling tasks by up to 50%, according to Zebra.

Empower your workforce, and optimize your operations with Zebra Robotics Automation — a robust, versatile, cloud-based software and hardware portfolio that delivers solutions for smarter automation.

Challenges

Companies have begun exploring the ways in which they can incorporate new technologies into their operations to enhance supply chain efficiencies and improve customer service levels. However, given the complexity and scale of most supply chains, many companies are reluctant to implement new solutions without clearly defining their value in the context of their organization's unique business processes and goals. For this reason, it is critical to justify implementing automation to ensure that it is effectively deployed across the organization and delivers the anticipated benefits. Socializing use cases will be important.

Automation brings many undeniable advantages in terms of production, accuracy, and efficiency. However, automation has its drawbacks as well. There seems to be an influx of automation equipment available on the market, making it very challenging for vendors that offer this solution. Automation can also have a high initial cost but an ROI that lasts only a few years. Robotics manufacturers tend to combat the initial investment cost by offering a robot-as-a-service offering. The RaaS model often allows for a low initial investment in which the ROI can be realized much sooner than the capital expenditure alternative.

Conclusion

With success comes its own set of complexities. Manufacturers are finding it challenging to align production with the rapidly shifting demands. In the constantly evolving realm of modern supply chains, the emergence of automation technology presents an opportunity for it to become a standard requirement that will increase production and streamline operations. The era of manual labor-intensive material handling is now a thing of the past; it was costly, demanded significant resources, and carried inherent risks. While staff members unquestionably play a crucial role in the broader scope of supply chain success and facility operations, the key lies in maximizing their potential. Enter automation, the optimal solution for relieving the financial strain associated with repetitive and mundane tasks. Embracing this technology is no longer a choice; it is a necessary step forward.

Companies seeking to integrate automation technology must establish connections with the appropriate technology providers, carefully assess the entire supply chain, optimize existing systems, and view this as a long-term strategy rather than a quick fix. By doing so, they will be well positioned for success both now and in the future. The optimal approach is not solely reliant on people or robotics but on a harmonious blend of both. This integration allows leaders to maximize resource allocation, reconfigure the overall worker experience, and improve operational efficiency.

In the ever-evolving landscape of modern supply chains, automation technology emerges as an opportunity to advance competitive differentiation.

About the Analyst



Roderick Gaines, Research Director, Worldwide Supply Chain Strategies: Warehousing, Inventory, and Order Management

Roderick Gaines is a research director of IDC's Worldwide Supply Chain Strategies Program. He is responsible for providing research, analysis, and guidance on key business and IT issues pertaining to manufacturing, retail, and healthcare supply chains. He currently leads IDC's Worldwide Supply Chain Strategies: Warehousing, Inventory, and Order Management practice, providing fact-based research, analysis, and insight on best practices and the use of information technology to assist clients in improving their capabilities in these critical supply chain fulfillment areas.

MESSAGE FROM THE SPONSOR

More About Zebra Technologies

Zebra (NASDAQ: ZBRA) helps organizations monitor, anticipate, and accelerate workflows by empowering their frontline and ensuring that everyone and everything is visible, connected, and fully optimized. Our award-winning portfolio spans software to innovations in robotics, machine vision, automation, and digital decisioning, all backed by a legacy of 50+ years in scanning, track-and-trace, and mobile computing solutions. With an ecosystem of 10,000 partners across more than 100 countries, Zebra's customers include over 80% of the Fortune 500. Learn more at www.zebra.com.

IDC Custom Solutions

The content in this paper was adapted from existing IDC research published on www.idc.com.

This publication was produced by IDC Custom Solutions. The opinion, analysis, and research results presented herein are drawn from more detailed research and analysis independently conducted and published by IDC, unless specific vendor sponsorship is noted. IDC Custom Solutions makes IDC content available in a wide range of formats for distribution by various companies. A license to distribute IDC content does not imply endorsement of or opinion about the licensee.

External Publication of IDC Information and Data — Any IDC information that is to be used in advertising, press releases, or promotional materials requires prior written approval from the appropriate IDC Vice President or Country Manager. A draft of the proposed document should accompany any such request. IDC reserves the right to deny approval of external usage for any reason.

Copyright 2023 IDC. Reproduction without written permission is completely forbidden.

IDC Research, Inc.
140 Kendrick Street
Building B
Needham, MA 02494, USA
T 508.872.8200
F 508.935.4015
Twitter @IDC
idc-insights-community.com
www.idc.com