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SPOTLIGHT

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To remain competitive, companies must adopt a more expansive view of the value of material handling automation and the true costs of the status quo. The economics of automation, along with bruised supply chains, have made the decision to automate critical for operations survival. Companies that don't automate will be left behind.

Making the Business Case for Supply Chain Automation

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AT A GLANCE

WHAT'S IMPORTANT

- As warehouses seek to boost efficiency by providing personnel with equipment and necessary training, IDC believes that the "hidden" costs of labor, particularly in the current environment, have been undercounted by as much as 50%.
- While concerns about a recession may slightly temper labor shortages in the short term, the longer-term expectation is that those shortages will become chronic, rendering the near-term decision to invest in material handling automation that much more vital.
- Warehousing, and distribution in particular, has been slow to adopt new technologies at scale because many organizations fail to grasp both the hidden costs of the status quo and the exponential value creation that automation can deliver over the long term.

Introduction

Global supply chains are being challenged in ways they have not been before. The global health pandemic, geopolitical tensions, logistic congestion, equipment constraints, labor shortages/negotiations, materials and labor inflationary pressures, security concerns, and the growth in ecommerce have had deep and lasting impacts. These disruptions have injected enormous uncertainty into supply chains, with over 573,000 warehousing positions currently available in the United States alone resulting in an estimated worldwide economic toll of $30 trillion. These pressures have caused businesses to reconsider the demand for technology and automation solutions that will assist supply chains in identifying issues and mitigating risks in the future.

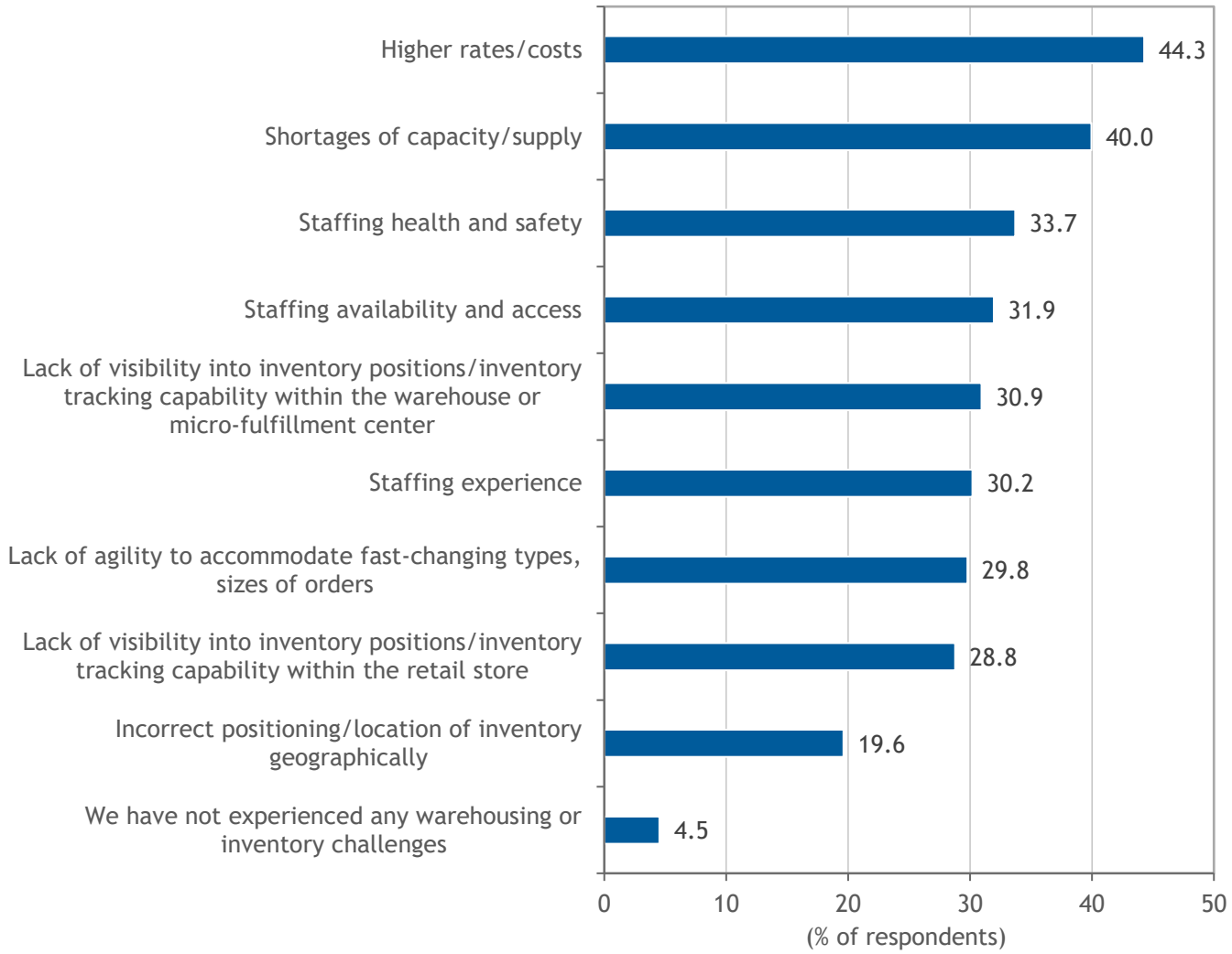
Many distribution centers and warehouses have seen a rise in demand, whether for goods or customers. On the other hand, the labor required to meet that growth has stagnated. In IDC's 2022 *Talent Survey,* over 44% of warehouses stated that they were not able to find adequate workers to meet their operational needs, with a further 30% saying that the workers they can find lack the skills necessary to do the jobs.

Job openings have remained unfilled for months, forcing warehouses to either increase candidate incentives, relax qualification criteria, or invest in forms of automation that would eliminate or reduce their reliance on such positions. The enhanced capabilities that supply chain automation provides will be invaluable in ensuring that businesses have the visibility, control, and metrics needed to manage and optimize their operations in today's rapidly changing environment. This will ensure companies serve their customers while driving profitability and growth.

According to a recent IDC supply chain survey, warehouse operators have been dealing with elevated labor rates/costs as well as limited staff availability and experience, leading to capacity and throughput shortfalls. In a related IDC survey, 33% of supply chains linked staffing shortages directly to an inability to meet their operational performance. Supply chain leaders have not yet adopted automation at scale. While some companies might have been able to "get by" with a piecemeal approach, it has exposed others to greater risk within the supply chain (see Figure 1).

FIGURE 1: ***Top Challenges for Warehousing and Inventory***

Q ***What have been the specific warehousing or inventory challenges your organization has faced in the past six months?***



n = 1,109

Source: IDC's Supply Chain Survey, 2022

Automation and hardware have advanced in conjunction with improved simplicity of integration, making robots as a service (RaaS) an option. Thus, solutions have become more readily available and easier to adopt at scale. Indeed, warehouse automation can result in increased productivity levels by two to three times when compared with manual labor, particularly in the current constrained environment. IDC expects that within the next three years, 75% of manufacturers will move to significantly automate jobs/roles to reduce the total number of employees required to operate facilities.

Converting Capex to Opex Frees Funding for Automation

In the past, automating warehouse operations involved the installation of permanent, "bolted to the floor" equipment. Those fixed systems would be unable to adjust if business requirements changed or new, more advanced automation technologies were available. They frequently became obsolete before a return on investment (ROI) could be realized. And, given the extensive implementation times, they were often insufficient by the time they were commissioned.

Traditionally, developing a business case for an automation shift has been difficult. Expensive, fixed asset capital equipment typically involves multiple levels of authorization. RaaS overcomes financial barriers, providing executive leadership with a speedy, low-risk, and cost-effective solution to accelerate automation.

With RaaS as an option, companies can now shift those expenses to the operating side of the house while also increasing production. The most intriguing aspect of RaaS is its near-instant impact on a warehouse company's production capacity and bottom line. In other words, RaaS can be deployed dynamically to scale up with the needs of the business. When automation is accelerated to support changing business requirements, the ROI is almost instant. Essentially, subscribing to the technology becomes an operational expense, allowing warehouses to reap the benefits rapidly.

The flexibility of RaaS service agreements can also make a significant difference. Agreements can accommodate user fluctuation by allowing customers to stagger payments to hit budget targets, add new equipment subscriptions to an existing agreement to meet immediate need rapidly, avoid obsolescence through regular software updates and hardware upgrades, and swap out equipment that may not be suitable to new workflows over time.

Customization and personalization at scale have also been concerns for companies. In previous years, automation was in the testing phase and therefore lacked the ability to scale as the business grew. This inability to scale was combined with the integration challenges inherent with existing software and technology already implemented at the facility. Now that automation is utilized in the mainstream, companies are acknowledging the benefits and value of warehouse execution systems and warehouse control systems that automation enables. Also, navigation and perception technology has improved to such a degree that automation solutions can, nearly out of the box, deliver highly tuned automation experiences designed to a specific facility without the massive overhead of a non-recurring engineering project.

The Business Case for Automation

It has long been IDC's view that the full cost of labor has not been fully factored into the business case for automation by companies taking a labor-first approach to their operational facilities. In the current labor-constrained supply chain environment, in addition to supply issues driving up the cost of manual labor though hourly wage rate increases, the hidden cost of that labor, and its impact on productivity, has often been undercounted by as much as 50%. Companies in manufacturing and wholesale distribution have a general understanding of the trade-off between labor and automation, but often the business case fails to account for important "hidden" factors. While such factors will vary by industry and by company, they are summarized as follows:

- **Labor availability.** The difficulty of finding enough people to fill existing and potential positions continues to plague warehouses, despite the willingness of many companies to dramatically raise wage rates. There are currently 425,000 vacant warehousing and transportation positions, according to the U.S. Bureau of Labor Statistics, with an expected 5 million positions needed over the next five years. According to a recent IDC talent management survey, over 44% of companies listed talent/labor as a top issue, with 33% stating that shortages are negatively impacting operational performance. In effect, labor shortages reduce productivity by 10–15%.

- **Turnover rate.** The rate of employee turnover is an underappreciated cost of a labor-first approach to the warehouse, particularly in an environment where rehiring is a challenge. Given the high demand for warehouse operations, employees must work long hours and under extreme stress to meet increased demands. The physical toll and stress of warehouse jobs combined with an aging and retiring workforce leads to higher turnover rates. The latest figures from the U.S. Bureau of Labor Statistics put annual warehouse turnover rates at 43%. IDC estimates that turnover results in lost productivity of 10–15%.
- **Employee training.** When new employees are hired, they require significant training. According to IDC research, less than a quarter of warehouses can train new employees in under a month. That means one to two months of less than full productivity from the new employees. Furthermore, the experienced employees who are training the new team members will have to alter their own priorities to do the training, which will affect their productivity. IDC estimates that higher levels of required training impact overall productivity by 5–10%.
- **Employee qualifications.** Productivity and efficiency can vary among team members. IDC has had frequent discussions with manufacturers that have had to lower their hiring requirements for new employees. In addition to impacting retention, lower hiring requirements can lead to increased truancy and absenteeism from less qualified employees and will mean lower productivity. Indeed, there is a high correlation between employee quality and greater callout rates. Factors that must be considered are unplanned activities such as higher incidence of sick days, excessive paid time off, injury resulting in days away from work, and employees' idle time. IDC estimates less qualified workers result in a 5–10% loss in productivity.

Taken in aggregate, the underappreciated costs of a labor-first approach can affect overall productivity by 30–50%. That fails to account fully for safety, which is a critical component in warehousing. According to the U.S. Department of Labor's Occupational Safety and Health Administration, the average rate of warehouse accidents is 4.8 for every 100 workers and businesses spend about $170 billion a year on injury and illness.

Automation equipment lead time is another factor to consider. Lead time for equipment averages six to nine months. Manufacturers have reported that lead times have increased, and certain components required to complete final assembly are difficult to source in a timely manner. Yet hard-to-find components are not the only things causing delays, as many equipment parts and products are also impacted by supply chain challenges.

Given the increasing magnitude of these "hidden" indirect labor costs, the incessant tire kicking and "perpetual pilot purgatory" that have characterized the use of automation and RaaS have seen their day. The time to move aggressively to broad warehouse automation is now. The ROI is there for companies that take a more aggressive and expansive view of automation.

Considering Vecna Robotics

Vecna Robotics is a flexible, intelligent material handling technology company that engineers and deploys automation solutions for repeatable workflows in medium- to large-scale facilities in manufacturing, warehousing, and distribution. Vecna's lineup has four autonomous mobile robots (AMRs) in two classes. The full-sized, fully autonomous class of AMRs includes a tugger (Vecna ATG), a pallet truck (Vecna APT), and a counter-balanced forklift (Vecna AFL) that focus on longer haul distances (>250 meters), higher throughput workflows (>75% utilization), and larger facilities (>200,000 square feet). The newly launched co-bot class of AMRs includes an operator-assisted pallet jack (Vecna CPJ) that is ideally suited to more nimble material handling automation in smaller spaces and for loads of up to 3,300 pounds.

The company's material handling automation solutions are powered by Pivotal, a tightly integrated software suite. Pivotal provides an autonomy package that drives all on-robot navigation, perception, and safety; an orchestration layer that runs fleet management, dynamic workflow management, and global traffic control; an analytics package that serves up reporting, dashboards, and continuous learning; and an integration layer that connects the entire solution to most common warehouse management systems to enable optimal task management between robots and human workers. Vecna also connects its active fleet of robots via the Pivotal Command Center that conducts remote monitoring and remote assist of any robot in the field 24 x 7 x 365.

The company's material moving solutions are sold direct and through select distribution partners with a focus on logistics/freight, grocery, ecommerce, pharma/healthcare, packaged foods, retail, and automotive. Most Vecna solutions are sold via the company's RaaS program, a multiyear subscription service that packages all equipment, software, maintenance, and monitoring services into a single annual fee. Vecna also provides comprehensive professional services for implementation and integration as well as dedicated customer success representatives for onboarding and ongoing optimization of its solutions.

Challenges

Disruptions are broadly impacting both pricing and availability of technology. Businesses are grappling with ongoing capital expenses and costs due to inflationary effects. These economic conditions will cause some technology projects and investment to lag as funds are diverted to maintain operations, while others will continue their campaign toward sustainability.

Conclusion and Recommendations

The productivity and profitability of warehouses are frequently determined by the efficiency and availability of material handling automation systems. Some warehouses want to improve processes, visibility, and accuracy, while others want to ship and transport effectively. Equipment that is flexible and modular allows for simpler reconfiguration to suit changing demand and the launch of new products.

Automation technology is crucial in building an agile supply chain. Manual material handling is costly, requires a vast number of resources, and can be hazardous. Individual contributors remain a critical component of supply chain success and will always be key to facility operations, but they must be utilized effectively. Automation helps reduce downtime and expenses that come with executing manual, monotonous tasks. Companies acknowledge automation as a vital step, as 35% are planning to implement warehouse automation over the next 12 months, according to an IDC survey.

Indeed, in this paper, we have articulated the range of "hidden" costs associated with manual labor, particularly in the current labor/talent-constrained marketplace. Companies should focus on material handling equipment and business models that will both improve operational resiliency and drive cost efficiencies. IDC suggests warehouses look aggressively to automation to address current and future labor shortages. RaaS offerings from vendors are a good example of technology that improves efficiency and costs. In the end, warehouses that adopt material handling automation will outperform their less agile counterparts.

About the Analyst

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Roderick Gaines is a Research Director for IDC's Worldwide Supply Chain Strategies Program, responsible for providing research, analysis, and guidance on key business and IT issues pertaining to manufacturing, retail, and healthcare supply chains. He currently leads the 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 Vecna Robotics

Vecna Robotics is an award-winning flexible, intelligent material handling automation company with solutions engineered for seamless work between autonomous mobile robots (AMR) and the labor, equipment, facilities, and systems that make business go. Their self-driving forklifts, pallet trucks, pallet jacks and tuggers — powered by Vecna's Pivotal™ orchestration software and 24/7/365 Command Center — help distribution, warehousing, and manufacturing organizations automate their most critical workflows, maximize throughput and scale operations fast. For more information, visit www.vecnarobotics.com.

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