WHITE PAPER

A practical approach to implementing robotics

Help prepare your warehouse for a successful deployment of robotic lift trucks with these steps

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LIFT TRUCK TECHNOLOGIES

Warehouse operations have warmed up to the idea that robotic solutions make real business sense and can help improve workflows. Some businesses may view robotics as a future proposition, but today's warehouses are increasingly tech-enabled and best-in-class operations expect their material handling equipment to reflect smart automation design and technology integration.

Unexpected events and underlying trends have compelled these operations to accelerate their timeline for warehouse robotics, from an opportunity for tomorrow to an essential for today. Specifically, labor costs and challenges persist and customer expectations continue to raise the bar for performance.

Modern robotics can spare operations the major investment of installing fixed infrastructure, with autonomous navigation technology enabling relatively quick deployment. But implementation still comes with numerous questions, from ROI and safety to IT, integration and planning. As facilities fast-track robotic adoption in response to industry challenges and to position themselves for long-term competitive advantage, careful preparation can smooth the path to successful implementation.

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Evaluating your operation as a candidate for robotics

The first step to successful robotics implementation is qualifying your operation – essentially, understanding where and how your operation best stands to benefit. Robotics are not a one-size-fits-all solution, so setting the stage for a tailored approach requires working with a trusted partner to first assess which applications in your facility are best suited for automation. This process encompasses an examination of the environment in which robotics would operate, the types of tasks they must complete and characteristics of the loads they must handle.

The following characteristics typically indicate an operation is well-suited for mobile robotics:

- Challenges sourcing and retaining labor
- Two-, three- and four-shift operations
- Repetitive tasks
- Long horizontal runs or vertical movements
- Indoor work setting
- Clean, smooth, dry floors
- Ramps or inclines less than 3 degrees

Aligning on the ROI

Another important early step is defining success — in other words, what level of return is necessary to make the investment worthwhile, and over what timeframe?

A significant CapEx budget is not a necessity for automation projects, as rental and lease options that essentially provide "robots as a service" would suggest. Return on robotics investments can also come more quickly than many operations may think possible. How soon? It is fairly common for most two- and three-shift applications to see ROI in less than two years.

When automating processes and calculating the associated payback, direct labor savings are obvious wins, with reduced expenses on hourly wages, overtime and holiday pay rising to the top. The Material Handling and Logistics U.S. Roadmap 2.0 supports this assessment, stating that "automation will likely continue to become less costly, while wages and benefits for human workers will increase over time." Determining and weighing the fully burdened labor rate against the cost of automating is key to understanding which approach makes financial sense. However, hourly labor rates are not the full story.

Automation can help drive savings in other indirect ways by potentially reducing costs associated with retraining and re-education, workers' compensation and lost time due to illness or injury. In industries like warehousing where average employee turnover is high, finding and replacing employees also involves considerable time and expense. Meanwhile, inexperienced operators are more prone to cause costly damage to the facility, equipment and product.

Enabling successful implementation

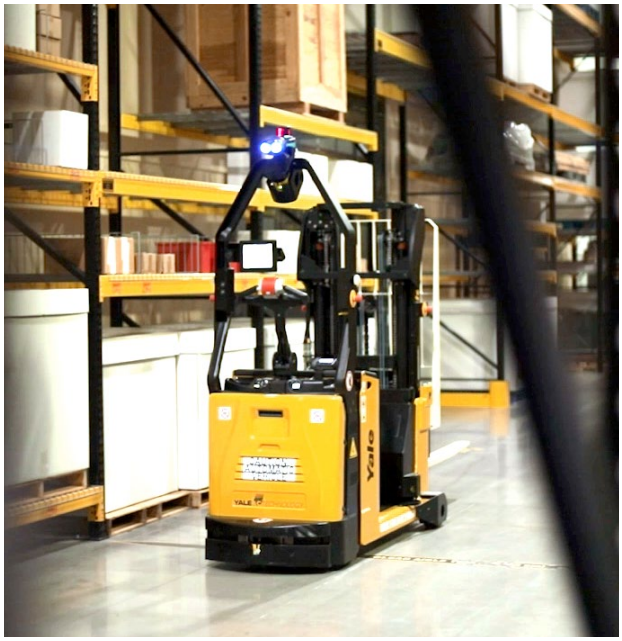
New technology can only be effective to the extent to which it is accepted, so thoughtfully introducing employees to robotics is an important step and opportunity. Best practices involve proactively informing teams about any changes to the workplace involving robotics, sharing how workflows will change and reinforcing the meaningful benefits of automation to your employees — namely, less repetitive work, allowing them to focus on more engaging value-added responsibilities.

As with all tools, proper safety training and protocols are essential. Train all employees on proper procedures for working in a facility where robots are present. Robotic lift trucks offer a unique capability for operator interaction, as they can be switched from automatic to manual mode. This dual-mode capability enables operators to adapt to unexpected circumstances and, when necessary, simply engage the controls as they normally would with standard lift truck equipment.

IT is also an important consideration. While integrating robotics software with the facility's WMS is not a requirement, it can enable more seamless operation and tightly managed workflows. Enlisting IT early in the robotics acquisition process can help with determining requirements and revealing any potential capacity issues that could make deferring WMS integration to a later phase a more attractive approach. Robotic lift trucks for instance, can handle basic point-to-point transportation tasks without requiring substantial software integration, enabling operations to get robotics up and running quickly.

Navigation technology is another feature to consider when weighing startup cost and time. While traditional automatic guided vehicles (AGVs) require installation of guidance infrastructure, mobile robotics do not share this requirement. They can operate based on an awareness of existing structural features like walls, columns and racks, simply requiring a "walk" of the facility to create an internal map to reference against what they see in real time to self-locate and navigate.

Beyond initial implementation: Keeping the future in mind



With fluctuating demand and a constantly evolving warehouse environment, automation investments must have the flexibility to meet the challenges of today… and tomorrow. For example, robotics that can be easily re-programmed and re-deployed in different settings can easily adapt to renovations, new workflows and other changes as business dictates. But the adaptability of individual robotics investments is only a piece of a complete plan for the future.

Beyond the initial robotics investment, operations can think of automation as a phased journey. Both the challenges that drive businesses to look for automated solutions and the capability and cost of robotic technology keep evolving. Incorporating robotics and automation into long-term strategic planning discussions can position operations to achieve future competitive advantage while also providing a framework for adaptation should conditions change, with the flexibility to accelerate timelines or adjust plans to fit the needs of the business.

Automation professionals from Yale can help you navigate the road to robotics for your operation. Contact an expert today.

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