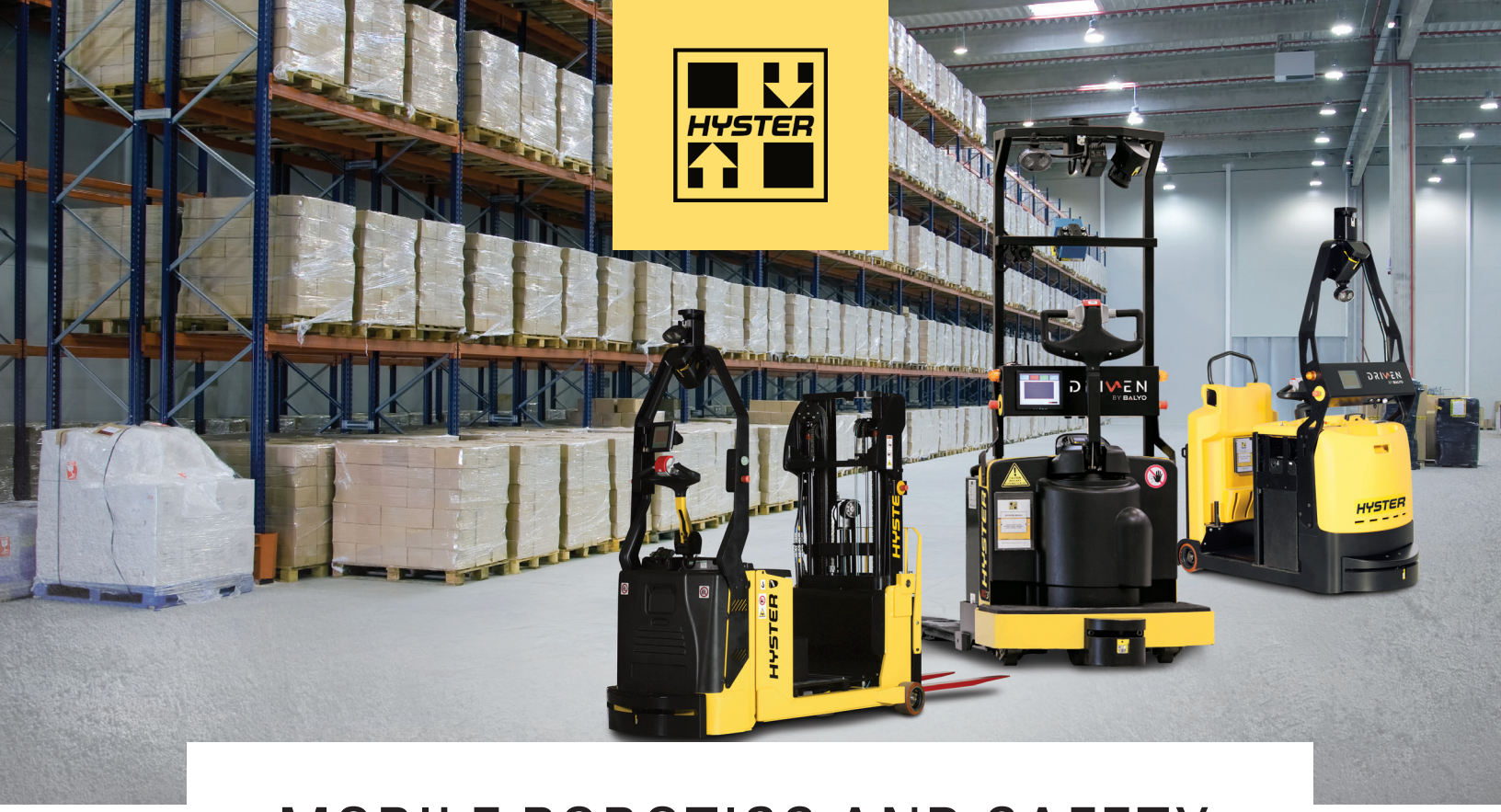


MOBILE ROBOTICS AND SAFETY: BUILDING A BETTER WORK ENVIRONMENT

Robotics are past the awareness stage. From horizontal transportation to storing and retrieving pallet loads at height, increasingly capable robotic solutions are becoming regular fixtures at manufacturing and automation events, and in trade and business publications across the globe.

And with technology advancing to become increasingly capable and scalable, the signals for greater adoption of robotic solutions are clear. What better way to augment your labour pool, enable social distancing, boost productivity, and improve retention than by automating repetitive, non-value-added tasks and focusing employees on more engaging, satisfying work?

The underlying industry forces make adopting robotics a impending reality, not just a possibility. Instead of building an understanding of robotic capabilities and their theoretical value, distribution centre managers are asking for practical guidance to turn robotic ambition into adoption.

As with any new technology, safety is a critical element in this move to adoption, especially with workflows that feature humans working in close proximity to their robotic counterparts. Answering the question of safety on the path to adoption requires understanding robotic lift truck functionality, navigation behaviour, and how their work can affect the roles of human counterparts – both in the normal course of business and in special circumstances.

The underlying industry forces make adopting robotics an impending reality, not just a possibility.

// MOBILE ROBOTIC NAVIGATION TECHNOLOGY

While traditional automatic guided vehicles (AGVs) require guidance infrastructure like embedded wire, reflectors, or magnetic tape to navigate fixed pathways, the latest robotic lift trucks represent a departure from that paradigm. Today's robotic solutions are capable of moving through indoor logistics environments without navigation infrastructure or an operator.

This competency is made possible by Simultaneous Localisation and Mapping (SLAM), in which robotic solutions use a reference map based on structural elements in the operating environment and compare it to what they sense in real time. This process allows the robotic lift truck solution to accurately and precisely self locate – no additional navigation infrastructure required.

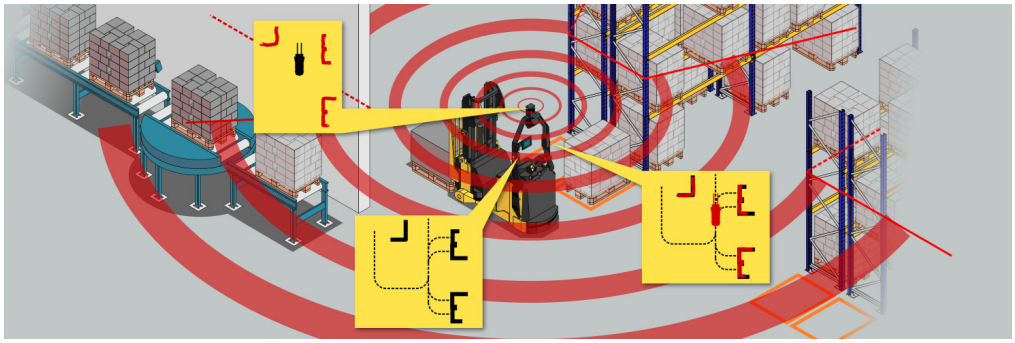
As know-how continues to mature and equipment decreases in cost, an increasingly popular navigation system is the laser-based technology, LiDAR – short for light detecting and ranging. This sensing method sends out pulses of laser light to determine the presence and distance of objects. To understand their location while in operation, mobile robotics use LiDAR to get the real-time "view" of surroundings and compare to the reference map mentioned previously through the SLAM process.

// MOBILE ROBOTS AND SAFETY

The consistent, strong performance of navigation technology and programming of site-specific rules enable robots to adapt to surroundings and real-time conditions, while strictly following safety protocols. This capability helps reduce the risk of accidents, collisions, or other safety incidents.

High turnover is common in logistics, and with inexperience among operators comes increased risk. Most health and safety governing bodies will advise that many forklift accidents could be avoided through better adherence to standardised training and safety procedures. By comparison, robotic solutions deployed on the shop floor perform according to their programming from day one – without the extensive onboarding and training required to bring new operators up to a satisfactory level of skill and experience.

Robots are predictable – they always follow safety procedures and can be programmed for site-specific rules of the road. And with humans working more frequently in close proximity to robots, training everyone who enters the facility on how to safely interact with robots is especially important.



To understand their location while in operation, mobile robotics use LiDAR to get the real-time "view" of surroundings

// HOW DO MOBILE ROBOTS AFFECT THE ROLE OF WORKERS?

While it's clear that safety can get a boost, another chief advantage of robotics might not be as obvious. For some, the idea of robotic colleagues might conjure a bleak or even dystopian scene for modern workers, but the evidence suggests otherwise.

Automation technology can actually make work more "human" and make people happier at work. Academic research shows that organisations augmented by automation technologies are 33% more likely to be "human friendly" workplaces, in which employees are 31% more productive. That's because robotics have the power to relieve workers of the monotony of repetitive tasks that are abundant in supply chain environments, and enable human workers to instead focus on more rewarding, higher responsibility work.

But delegating repetitive tasks to robotic solutions goes beyond busting boredom for employees, though it does that too. Enabling employees to concentrate on more strategic work better equips them to remain focused and practice good judgement – both major advantages for site safety and overall productivity.

Scientists have found that monotonous work can negatively impact mental health, cause major stress and lead to burnout. In her paper, "Neuroscience Reveals That Boredom Hurts," Dr. Judy Willis, a neurologist and former school teacher, claims that when we're bored our judgement, goal-directed planning, risk assessment, focus, and control over emotions all suffer.

Academic research shows that organisations augmented by automation technologies are 33% more likely to be "human friendly" workplaces, in which employees are 31% more productive.

For most workers, risk-assessment, focus, and judgement are a matter of performance. But for workers who spend their shifts supervising machinery, manoeuvring heavy loads, and operating in a fast-paced environment, those factors are also fundamental to safe – and effective – operation.

As the conversation around employee engagement continues, robotics can play a part in shaping more meaningful work experiences. Improved job satisfaction is significant for individual employees, but it's also a benefit to operations. According to research, organisations with better employee engagement achieve higher performance, including substantially better retention, fewer accidents and increased productivity.

In a typical manually-operating material handling operation, the most significant cost is related to the operator. Not only is there a cost in employing the operator, but there are considerations to product and equipment damage, training, and work quality. Finding and training new hires can cost thousands, so using robotics to shift human workers toward responsibilities that help engage and retain them makes good business sense, too. Whilst the initial cost of entry may be higher than a manually-driven truck, a Robotic Forklift Truck can provide significant cost savings over a relatively short period.

// LEVERAGING COMPLEMENTARY STRENGTHS

Human-robot collaboration can capitalise on the unfaltering reliability we expect from robots, and the knowledge, creativity, and decision-making skills of people. An example might include a worker who shifts her focus to picking and retrieving, assembling pallets, and other more complex, high-value tasks while an automated lift truck takes on the work of repeatedly traversing

the facility, transporting product from point to point. Spared from accompanying the lift truck, the worker invests more time completing high-impact tasks that both exercise and benefit from strategic thinking and problem solving. As the robotic lift truck fulfills needs throughout the facility, several features help it serve as a good steward of a safe working environment.

Robotic lift trucks adhere without exception to the facility's "rules of the road," such as maximum speed or minimum distance from pedestrians, other equipment, facility infrastructure, and more.

Management software can direct robotic lift trucks to take predetermined routes to avoid heavy traffic areas. For operations with multiple robotic lift trucks in use, this ability to manage routes to help avoid bottlenecks is especially valuable, both for efficiency and safety-orientated benefits.

A reduction in congestion can allow pedestrians and manually operated lift trucks to more easily navigate without delay or incident. That seamless traffic flow is especially valuable as businesses ramp up storage capacity and output during seasonal peaks and other demand fluctuations

// INTRODUCING ROBOTICS TO YOUR OPERATION

Advancements in underlying technologies have made robotics increasingly attractive. These technologies enable solutions that reliably practice facility traffic protocols, allowing them to drive productivity and work according to safety guidelines. Though as with any tool, training workers on how to properly interact with them is just as essential.

Once employees are thoroughly trained on proper protocol, putting robotics to work in your operation can also help provide a more nuanced benefit – freeing up workers to focus on roles that keep them more mindful and engaged.

The Hyster Robotic Lift Truck range is based on our own manually-driven forklift trucks. This gives the typical mechanical and electrical reliability, parts availability and service network support of a mass-produced industrial vehicle to a Robotic Forklift Truck - something not previously found until recently. Being also able to be driven manually means that operational flexibility is a given. In the event of a problem, a manual operator can take over a task - giving peace of mind during ordinary and extra-ordinary operations.

To learn more about how Hyster robotics can support your operation, contact a solutions expert at your local Hyster® dealer, or visit https://www.hyster.com/en-gb/europe/industry-solutions/robotics/hyster-robotics/