YOUR JUST-IN-TIME OPERATION IS EFFICIENT, BUT IS IT RESILIENT?

Just-in-time manufacturing depends on supply chains operating at the highest-levels of precision possible. Materials arrive on-site just before manufacturing commences, enabling production operations to stay lean and squeeze maximum output out of available space, but leaving little slack time or margin for error. This paradigm pressures each piece of the supply chain to hold up its end of the bargain, from shipping vessels to materials handling equipment.

The COVID-19 pandemic presented unique challenges to global supply chains, with lockdowns and public health effects wreaking havoc and causing delays for finely tuned manufacturing operations. But that was just the beginning – semiconductor and other commodity shortages in the automotive industry led to temporary plant closings and a shift to a more proactive approach to component sourcing, rather than the purely lean methods that have guided manufacturers for decades.

Because of this, just-in-time philosophies are giving way to a resurgence of "just-in-case" planning, but the underlying drive for maximum efficiency remains exceptionally intense at all levels. Profit margins that are often less than 10 cents on the dollar mean manufacturers cannot afford to abandon the just-in-time philosophy's extreme cost consciousness. Rather than adding waste for the sake of "just-in-case" planning, manufacturers need resiliency in supply chains, achieved through simplicity, flexibility, speed – and yes, some strategic, efficient stockpiling and redundancy.

This white paper examines how industrial trucks can support lean, just-in-time strategies, helping manufacturers manage supply chains for maximum efficiency and resiliency.

// EQUIPMENT UTILIZATION

Lean manufacturing strives to eliminate waste while maximizing productivity. Applying these principles to managing a fleet of lift trucks means having the right volume of the right equipment to meet demand, with minimal idle time. The goal is to avoid wasteful spending on excess pieces of equipment and align fleet composition with what equipment is actually used the most.

How can manufacturers know if their fleet is structured properly? Lift truck telemetry provides the raw data and framework to understand it, uncovering insights and driving decisions that reflect the lean ethos. Utilization data is key, answering the simple question of which pieces of equipment are used most often. For seldom used lift trucks, manufacturers can reduce permanent stock and rent when needed, whether to meet an unexpected peak or handle seasonal demand. Manufacturers can also look at utilization data across locations, informing decisions to redeploy equipment to other facilities where it can provide the most value and avoid acquiring excess equipment.

// EQUIPMENT RELIABILITY

While a lean lift truck fleet eliminates idle time and reduces cost, it leaves manufacturers with a low tolerance for downtime. Reliability is the foundational requirement for material handling equipment in manufacturing operations. The consequences of unreliable equipment run counter to the just-in-time philosophy, leading to waste – excess lift trucks held on hand to protect against the risk of equipment downtime grinding business to a halt.

No matter how tough equipment is, proper maintenance is critical to reliable performance. Telemetry helps businesses strike the happy medium of effective maintenance without performing unnecessary service. Rather than relying on general maintenance intervals, telemetry helps determine necessary service actions for individual trucks, based on actual, real-time, asset-specific data and diagnostics.

The constant monitoring of equipment status and precise service intervals enables preventive service to be completed around operational schedules, helping minimize the impact of service on normal business. Fault code monitoring also preserves productivity by triggering automatic service orders for proactive maintenance, helping prevent minor issues from escalating into more serious problems, without any administrative burden on equipment operators or management.

DOWNTIME: WHY DOES IT HAPPEN AND HOW MUCH DOES IT COST?

Faulty equipment is a common cause of downtime. But a survey from GE Digital found that 70% of companies are exposed to this risk, lacking complete awareness of when equipment is due for maintenance or upgrade. And of the 82% of companies that experienced unplanned downtime over the past three years, those **outages lasted an average of four hours** and **cost an average of $2 million.**

// SPACE OPTIMIZATION

The lean, just-in-time paradigm dictates that manufacturers should limit the amount of inventory stored on-site to avoid storage space encroaching on production capacity. But with the risk of component shortages, operations must consider keeping inventory in reserve to help guard against supply chain disruptions restricting capacity and shutting down plants.

This renewed interest in resiliency can motivate manufacturers to ask upstream component suppliers to hold a backlog of critical inventory, such as resin, castings, forgings and electrical components. Or, manufacturers can pursue storing extra inventory themselves.

Regardless, the most efficient way to store inventory is to take full advantage of a facility's cubic volume – with tall, narrow-aisle storage configurations that take advantage of vertical space. This approach is especially relevant now, with the rising cost of industrial real estate pressuring operations to max out capacity in existing space and avoid expensive expansions and new construction.

Material handling equipment plays a big role in the viability of space-efficient layouts. For example, narrow aisle reach trucks and very narrow aisle turret trucks are engineered for maximum efficiency in tight storage configurations. Specifically, their ability to lift higher and be maneuvered in narrower aisle widths allows them to be effective in configurations that would be incompatible with standard equipment.

But what if operations could make additional space available – essentially getting the benefit of an expansion – without construction costs? By switching from lead-acid batteries to alternative electric power options, they can. Powering lift trucks with lead-acid batteries requires indoor space dedicated to battery changing, watering, charging and storage. But hydrogen fuel cells and lithium-ion batteries do not present this intense space requirement, enabling operations to repurpose areas for additional storage or revenue-generating activities.

PREPARING FOR THE NEXT COMPONENT SHORTAGE

The COVID-19 pandemic demonstrated how susceptible global supply chains are to disruption. For example, the semiconductor shortage caused major automakers to lose significant production volume, resulting in a million fewer cars built in the first quarter of 2021.

Many analysts forecast that this shortage will not be a unique occurrence, but a sign of things to come, pegging raw materials, parts for electric batteries and motors as candidates for future scarcity. As the saying goes, "Fool me once? Shame on you. Fool me twice? Shame on me."

Prepare for the next potential shortage:

- **Increased visibility** through several tiers of suppliers to help provide early detection of potential bottlenecks
- **Dual- or multi-sourcing of key components**, building redundancy in suppliers
- More robust demand forecasts that allow suppliers to see much larger windows – allowing them to plan for six months' worth of demand, rather than two weeks
- **Stockpiles of key parts or materials** at production facilities and at other levels of the supply chain to provide a cushion of backup inventory

// LABOR PERFORMANCE IMPROVEMENT

The waste that lean and just-in-time principles aim to minimize extends to time lost to dwindling operator productivity, incidents and injuries. Research credits human error as the cause of 23% of unplanned downtime in manufacturing. And specific to material handling, 70% of forklift safety incidents can be attributed to operator error. How can manufacturers work to improve the performance of lift truck operators?

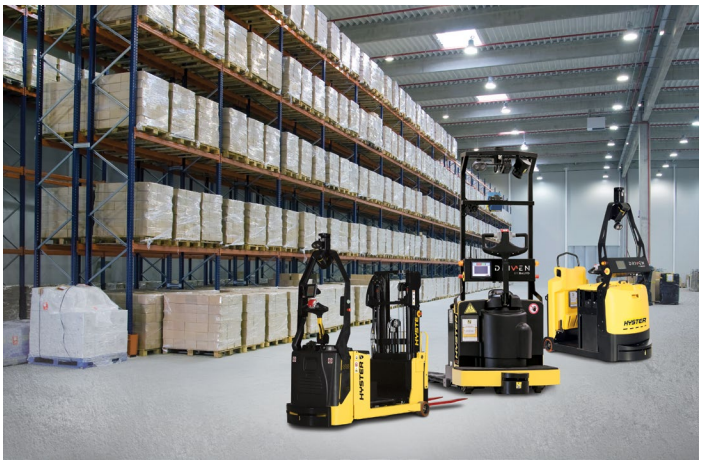
In addition to high-quality, OSHA-mandated training, technology can play a role in both evaluating and improving operator performance. Telemetry data such as utilization and impact alerts can be assigned to the specific operator, helping managers identify high performers as well as those in need of further coaching. The controlled access function allows only operators with the proper certification for that specific type of equipment to operate the lift truck.

A newer advancement, operator assist technology, can help support lift truck operator best practices in real time. It automatically adjusts truck performance based on equipment status, location and operating conditions. For example, the truck automatically slows down as it approaches a four-way cross intersection, speed is limited in designated pedestrian areas, hydraulic lock-out prevents operators from moving loads that exceed the truck's weight threshold – and much more.

// MOBILE ROBOT DEPLOYMENT

Labor challenges, whether due to turnover or finding staff to begin with, threaten just-in-time success through disruptions or lost productivity. Turnover in U.S.-based manufacturing reached 44.3% in 2020. Deploying robotic lift trucks to handle repetitive point-to-point load transportation tasks can allow employees to focus on more engaging, value-added work. Enabling personnel to concentrate on more strategic work better equips them to remain focused, and according to a Gallup study, organizations with better employee engagement achieve substantially better retention.

These robotic lift trucks are not the same as traditional AGVs used in manufacturing – they can adapt to obstacles and move around them, keeping loads moving on time to tightly scheduled production lines, combining the predictability and reliability of automation with the flexibility to adapt to the reality of the shop floor and changing layouts. Whether using robotic tow tractors to move carts into position to keep assembly lines moving or robotic stackers to pick up palletized loads at the end of production lines, robotic lift trucks can help enable the stable, predictable material flow from production areas manufacturers require. But horizontal transportation is only the beginning – robotic reach trucks can store and retrieve pallets from storage locations 30 feet high, opening up a range of additional tasks for automation.



// CONCLUSION

Unique global events and related supply issues are spurring change in manufacturing. What was once a laser focus on the just-in-time paradigm is now tempered by a level of just-in-case planning, pressuring material handling operations to support evolving methods of doing business. Doing so requires a partner with the broad range of experience, both in manufacturing and elsewhere in the supply chain, to apply new ideas and technologies that uphold the standard of efficiency that modern just-in-time manufacturing requires.

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