

Lift Truck Technology: How to listen to a lift truck

The lift truck is evolving into a platform for data collection, enabling managers to optimize the equipment, the operator, and the facility.

BY JOSH BOND, EDITOR AT LARGE

Few fleet managers will be surprised to learn that a modern lift truck can collect data about every facet of its operation, well beyond the simple hour meter. Many are familiar with the concept that microprocessors onboard even the most standard lift trucks are ready to interface with computers, tablets, voice systems, or a warehouse management systems (WMS). What they might not know is that this capability is not reserved solely for massive fleets with deep pockets.

The brains inside modern lift trucks are great for turning them into advanced mobile data collection platforms, but they are also designed to enable small, specific changes to a lift truck's operation, even for a fleet of one. These changes increasingly allow a lift truck owner to shape the lift truck to the application while improving the productivity and uptime of both.

With plug and play technology, a lift truck can even be made to respond

to voice commands. Other solutions enable reach truck forks to rise to the precise level of the pallet opening at the push of a button. By collecting information about a lift truck's travel through a facility, it's also possible to identify areas of traffic congestion, restructure the placement of racking, or pinpoint problems with the floor surface that could lead to excessive damage.

But for all the innovative options, the most important factor to consider before a fleet owner unlocks the potential of the modern lift truck is whether it will create measurable results. "A lot of technology has come onto the scene in the last 10 years, and it can be distracting to a fleet owner who is just trying to procure a piece of equipment," says Scott McLeod, president of Fleetman Consulting, an independent forklift fleet management and procurement consulting company. "As lift truck suppliers try to differentiate themselves, customers should be careful about gimmicks and look for tangible results."



To help readers feel less overwhelmed and more empowered, *Logistics Management* spoke with a collection of lift truck suppliers to learn how a few technology options can be best used to optimize productivity and processes.

Listening to the lift truck

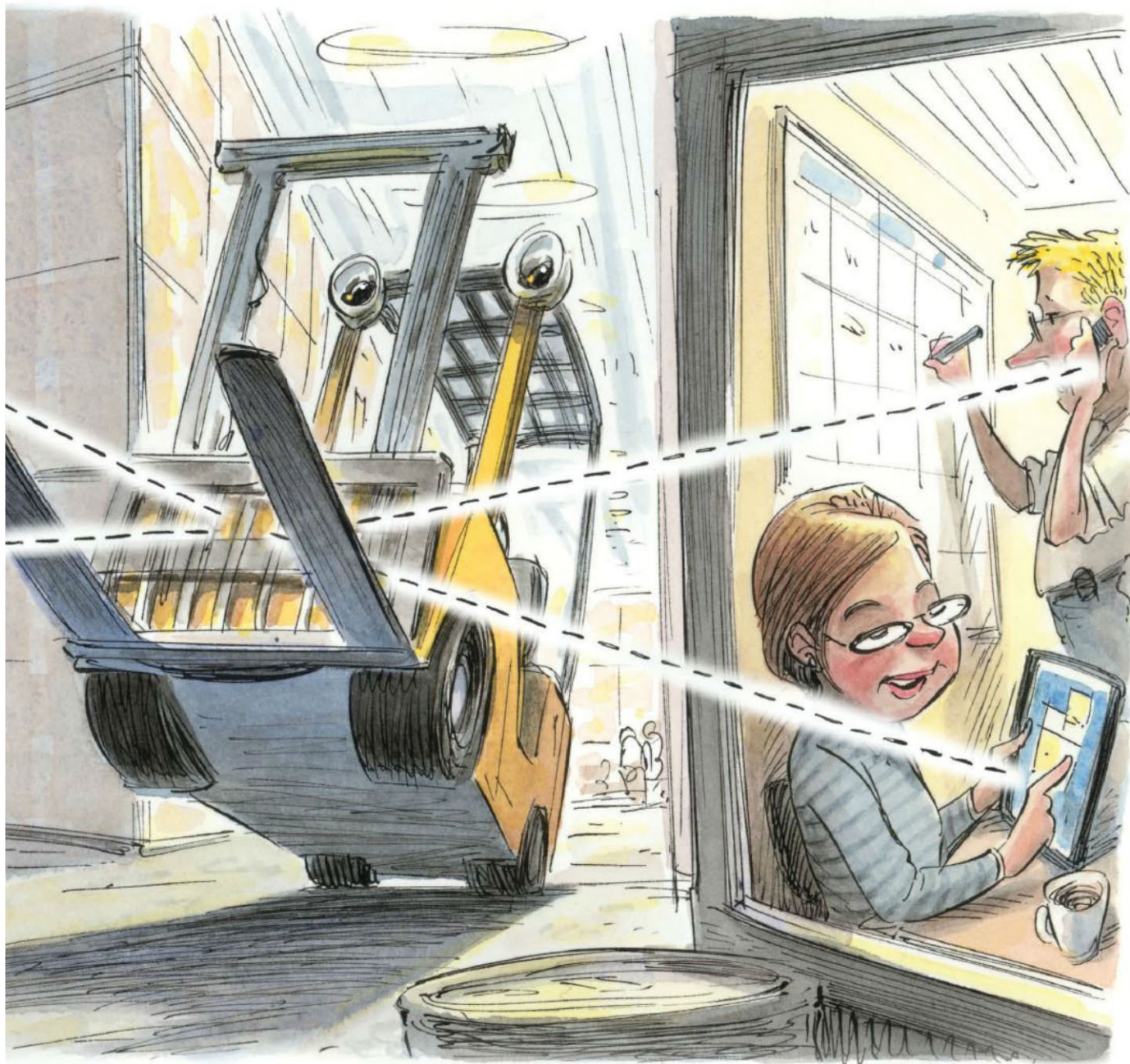
Borrowing from the automotive industry, diagnostic ports and microprocessors began to creep into lift trucks within the last decade. Lift trucks

are now primarily not governed by mechanical systems, but by electronic ones, with wires replacing levers. Sensors embedded throughout the lift truck can now collect data about every aspect of a lift truck's operation, from lifting and lowering to idle time and average speed.

In an effort to make the most of this available data, the popularity of fleet management technology has grown as well, even if the results of such implementations have been mixed.

The most common culprit of a failed implementation is the inability of the customer to effectively manage all the data the lift truck can produce.

"Data in a variety of platforms, many times not integrated, can be overwhelming to customers if left unattended," says Mark Faiman, product manager, IC, AWP, and GSE products for Toyota Material Handling. "The customer might review reports periodically, but without a conclusion or direction little progress can be made toward improving



DANIEL VASCONCELLOS

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a process or productivity.”

Thankfully, the technology on lift trucks allows data to be relayed directly to the dealer, who is increasingly called upon to manage that data on behalf of the customer. “When customers buy this technology, probably 80 percent of the time their expectation is that they will somehow get control over it themselves,” says Jonathan Dawley, president of Hyster Company distribution. “Then they find that they really don’t have the time to dig through all the data. The other 20 percent of the time, we are effective in explaining that our fleet management expertise can help them focus on their core competencies.”

For instance, a lift truck can report a fault code to a service technician who can repair the problem before the customer or operator knows something is wrong. An overheated lift truck might need \$20 brushes and one hour of labor. But in the interest of productivity, an operator might turn the lift truck off, reset the fault code, and get

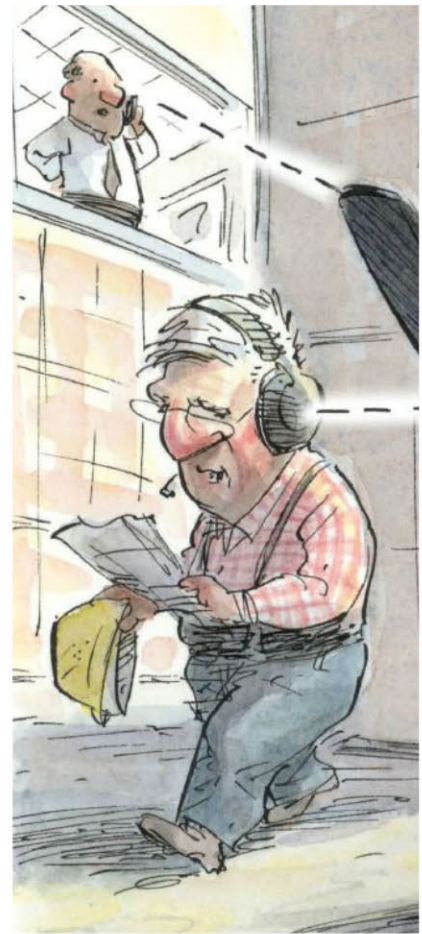
back to work.

“They’ll keep doing that until the equipment fails,” says Scott Craver, product manager of business and information solutions for The Raymond Corporation. “That customer is now looking at a blown \$700 motor and a much lengthier downtime.”

Reading between the aisles

The assortment of sensors on a lift truck is good for tracking what lift trucks do best, which is pick things up and put them down. But the data they collect also paint a picture of processes and pinch points throughout a facility.

“By far, the biggest trend we see is creating business intelligence using the lift truck almost as a sensor in the warehouse,” says Lew Mancini, director of product development for Crown Equipment. “It has to do with the fact that the WMS can see what happens at each bar code scan, but it can’t see what happens between them. The lift truck now has the capability to



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collect that information and provide it to management.”

Managers can now identify high traffic points and look at how the facility layout might change to make traffic run more smoothly. And while impact monitors will tell a manager when a collision has occurred, says Craver, a deeper look into the data might reveal that the operator is not entirely to blame for each impact. Damage could also be caused by variances in the dock level or cracks in the floor that can ruin wheels and tires, resulting in big costs.

According to Carver, one customer used this technology to detect that a particular operator tended to have a lot of impacts around 10 a.m. every morning. Someone else had been unloading trucks and putting some heavy materials in the operator's way. While navigating the containers, he would often collide with them. “We adjusted the facility layout, creating a path that improved that operator's speed and productivity while eliminating that

damage,” says Craver. “Some managers might just write him up. Others will look into the data for a huge return on investment.”

Beyond picking things up and putting them down

Even the most rudimentary modern lift trucks come with standard diagnostic ports and microprocessors. “The difference between lift trucks of today versus 10 years ago is that they have a brain,” says Bill Pflieger, president of Yale Distribution for Yale Materials Handling Corporation.

But while the electronics embedded throughout the lift truck are great for sending data out, they also allow commands to be sent in. The operator's controls no longer rely solely on levers and hydraulics, but pass through the central brain of the lift truck. This allows a variety of technologies to directly control various functions of the equipment.

For instance, when integrated with the facility's WMS, an onboard

computer can direct an operator to a pick location. Once the operator reaches the location, whether 100 inches or 400 inches high, he or she can simply press a button on the computer screen to send the forks up at the fastest possible speed before they stop precisely in front of the pallet opening.

Similarly, the lift truck's onboard intelligence can control the process of lowering the mast. By monitoring the forces applied during descent, it's possible to more than double the speed of lowering. “In tall or narrow aisle racking, lowering can account for 25 percent of the overall lift truck cycle,” says Mancini. “By doubling the speed, customers can see a 12 percent or 13 percent improvement in productivity.”

The microprocessors in a lift truck can also enable anti-slip technology that monitors wheel spin and improves traction in applications with slick floors, such as cold storage. The same onboard electronics make it possible to configure a pallet jack to accept voice



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commands, says Dawley.

By integrating with an existing voice picking solution or operating as a standalone module, this voice technology can allow a picker to advance the lift truck while a few steps away in a pick location. Married with some guidance technology borrowed from automated guided vehicles (AGVs), the lift truck can even sense and avoid obstacles as it moves alongside a more productive picker.

Tailoring the lift truck

Instead of shaping an application around the limitations of an off-the-shelf lift truck, technology enables a lift truck to be highly customized to the application. One example is narrow aisle applications, where traditional wire guidance or rail guidance are enough to keep the lift truck safely away from racking. But radio frequency identification (RFID) technology is capable of communicating a variety of information to the lift truck that can alter its performance, according to Chad Munger, product line manager, warehouse products, for Mitsubishi Caterpillar Forklift America.

For instance, an RFID transponder embedded in the floor of a facility can ensure a lift truck will only lift to a certain height near low-hanging air handling units or conveyors. It can control deceleration at the end of an aisle, or bring the lift truck to a complete stop.

By tracking the speed and direction of travel of the lift truck, RFID can also position the equipment in three dimensions. If moving from one elevated pick location to the next, the operator need only apply the throttle and the system will determine the precise optimal speed to travel forward, lower, then elevate again, ending directly in front of the desired location.

"When an order or command is received, the operator simply navigates to the correct aisle and the lift truck takes over from there," says Munger. "Through this technology, the WMS can actually manage the equipment, instead of relying on the operator to make each of these decisions about what he'd like to pick next. Even with the most experienced operators, effi-

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Brandon Lutton, manager of product engineering for UniCarriers Americas Corporation, offers another example of the ways a customer can shape the lift truck to their needs. He recently worked with a customer to integrate onboard scales, which required extensive collaboration between the scale supplier, the onboard computer supplier, the bar code scanner supplier, the customer, and UniCarriers.

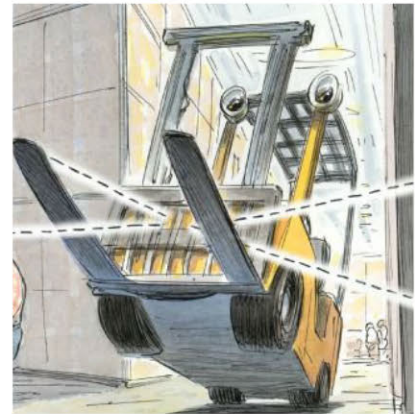
In the past, Lutton's department primarily installed attachments, applied special paint colors, and installed aftermarket parts. These projects typically take two to three weeks from order to application, as compared to three months for the scale customer.

"The amount of changes made for this individual project were greater than what would typically be required for an entire model upgrade," says Lutton. "I expect these sorts of projects to be more common in the future as customers demand fully integrated lift truck technologies."

Tips from the scales

Lutton's customer is not alone in benefiting from lift truck-mounted scales. The growing trend sees many lift trucks that can now bypass a stationary scale to weigh product on the move. When integrated with the WMS, this can add further visibility and accountability into product movement.

"This helps eliminate lost revenue created by shipping weight discrepan-



cies, which can have a major impact on operation costs," says Toyota's Faiman. It can save on labor, fuel, and travel time by eliminating trips to scale stations or having to repack pallets to weigh items, while recovering floor space previously used for scale stations.

"Quite frankly I wish the onboard scale would be standard on every lift truck and not an option," says McLeod, who says improved safety is an essential byproduct of integrated scales. "It allows a lift truck operator to know he's operating within safe limits. This is a huge issue as I see it. A lot of the experienced people just do it by feel, but you need to know the capacity of your forklift and you should know what the load weighs along with its corresponding load center."

As with each of the many lift truck technologies, a scale can be attached to the lift truck for the simple benefit it provides, or fully integrated with the customer's other technologies for even bigger results. Although the latter option calls for a much more involved project, Craver predicts the combination of data from the WMS, onboard scale, fleet management, and labor management will become more common, in a trend he calls "data fusion."

Hyster's Dawley agrees: "There's a gap there at this point, but I foresee these systems starting to come together, and a complete picture of what is going on in the facility will emerge."

Josh Bond is Editor at Large for Logistics Management