

strategic insight | Lift Truck Fleet Management

remote control *By Toby Gooley*

By Diagnose lift-truck performance from afar? It might sound like science fiction, but it's now possible—and it has the potential to change the way you manage your fleet.

People who design, manufacture, and sell lift trucks tend to be practical types who take a pragmatic approach to business. But a relatively new technology has even this down-to-earth crowd excited. They are so enthusiastic about it that some are calling it the biggest advance in lift trucks since the equipment was first invented.

What they're all fired up about are fleet optimization systems that automatically collect, transmit, and analyze data about vehicle performance and productivity—remotely and wirelessly, without requiring the fleet manager to be anywhere near the vehicles. Only a handful of truck manufacturers—Crown Equipment Corp., Hyster Co., Raymond Corp., and Yale Materials Handling—offer comprehensive systems right now, but others reportedly are developing them. Several software companies (see sidebar) also offer these systems; some of the truck makers, in fact, have partnered with those vendors.

Why develop automated data collection for a traditionally hands-on environment like the warehouse or distribution center? “We saw an opportunity to use technological advancements to raise the bar on customer satisfaction,” explains John Russian, manager of fleet marketing at Hyster. A bit of whiz-bang technology is sure to impress customers, but Russian and others who offer fleet optimization systems emphasize that the technology is not just for show. These futuristic systems, they say, are designed to help fleet managers and lift-truck dealers solve specific fleet management problems while reducing maintenance and operating costs.

Built-in flexibility

As the companies that offer fleet optimization systems are quick to point out, capabilities vary with the system and the developer. Typically, though, they capture performance data from individual vehicles, wirelessly transmit that information to a central server, and make it possible for a remote user—potentially located anywhere in the world—to analyze data through a Web-based database in order to manage fleet operations, costs, and maintenance. Examples of the kinds of data-tracking and performance-monitoring capabilities that these types of systems provide include the following:

- Maintenance and repair—recording and notifying management of hours of use for various motors, battery charge level, parts failures, engine temperature, and more; scheduling preventive maintenance based on actual usage and notifying the fleet manager and dealer.
- Impact detection and reporting—recording time and location of impact, identifying driver and vehicle,

and sending out an alert. Some systems will shut off the engine when a certain degree of impact has been detected.

- Safety compliance—verifying OSHA checklist completion and notifying managers of problems.
- Performance and operational metrics—measuring travel and lift time and distance, deadhead travel, asset utilization, and more. Some offer “geotracking,” which monitors trucks’ location and limits their access to specific areas.
- Operator supervision—controlling drivers’ access to trucks based on training and other considerations, remotely adjusting vehicle settings, and tracking driver productivity.

Most of the systems employ a harness with sensors attached to various parts of the lift truck to collect data. An exception is Raymond’s iWarehouse system, which acquires data through a single connector called the iPort that plugs into the CAN bus—the truck’s electronic “brain.” (CAN stands for “controller area network.”) Both types gather a wealth of accurate and up-to-date information, but plugging into the control center provides access to more types of data than a harness, with its limited number of entry points, can provide, says David Furman, Raymond’s vice president of marketing. (Other lift-truck makers reportedly are developing similar data collection systems.)

When it comes to data transmission, there’s a lot of flexibility built into these systems. Users can specify whether they want constant transmission in real time or transmission at specified intervals. The systems are designed to transmit data using types of wireless infrastructure that are commonly installed in warehouses and DCs to communicate with warehouse management systems. Among the technologies in use now for data transmission are digital paging, 802.11 WiFi, cellular service, and 900 MHz radio waves. Buyers that already have one or more of

those capabilities in place usually can transmit data over their existing wireless systems with little or no additional infrastructure required. For some customers, Yale also uses “beacons” to triangulate the location of a piece of equipment. In its Asia Pacific operations, the company uses RFID capsules embedded in the floor to track vehicle locations. Crown, meanwhile, employs “access points” attached to the ceiling to collect and forward data.

Each transmission method has its pros and cons, and some are more reliable than others. Availability of bandwidth for carrying large amounts of data, potential for interference from other electronic equipment, reliable penetration throughout the facility, and cost are considerations. **Users often need to use different types of communication for different services, notes Scot Aitcheson, director of Yale’s fleet management group. For example, “geofencing” (which limits where individual trucks can operate and controls their speed in specific areas) requires 900 MHz or the use of RFID tags; the less expensive 802.11 WiFi transmission can’t accommodate that function yet, he says.**

Most of the forklift manufacturers offering the systems have teamed up with software vendors that specialize in remote equipment tracking and data transmission. Hyster and Yale (both part of NACCO Materials Handling Group) work with On-Board Communications for their remote hour-meter reader, and they have partnered with I.D. Systems for more complex asset management functions. Raymond, meanwhile, has partnered with industry veteran ShockWatch. Only Crown is going it alone with its InfoLink system. “We feel the system is going to be more robust ... and up to date if we control everything,” says Matt Ranly, senior marketing product manager. “By not working with a third-party provider, we are getting customer feedback through our own system in a closed loop.”

The power of software

Fleet optimization systems pour data into central servers, and proprietary software then makes the information available in Web-based databases so users can review it and produce reports on individual trucks, drivers, and facilities. It's not just a "here and now" type of application, though: Users can aggregate data to gain a higher-level view, conduct comparisons among equipment and facilities, and spot longer-term trends.

The reports—more than 100 different options, although users typically focus on a dozen or two—make it possible to collect accurate information and use it to precisely measure costs, productivity, and asset utilization. For managers who have always relied on manual data collection and estimates based on experience, this reveals several layers of information they could not get before. "Do not underestimate the power of reporting software," says Hyster's Russian. "This is untraveled territory for many customers."

Because data management is Web-based, users can view it from practically anywhere, in real time. "If you're the guy in corporate who's in charge of warehousing and you want to check on various fleets across the United States and even beyond, you can do it from your desk," says Ranly of Crown. Even local operators may benefit from multiple views. "You might be one person in charge of all the lift-truck fleets at five warehouses in Chicago. The system gives you that power at your fingertips."

Downtime costs big money, so the ability to remotely diagnose and report a problem can save plenty. When, for example, there's a breakdown or a part begins to fail, the fleet management system automatically notifies the supervisor and the dealer of the details, including fault codes, says Aitchison. Instead of getting a call, coming out to examine the truck, and perhaps returning to the dealership to pick up a part before actually getting down to work, the technician can diagnose the problem off site and arrive with the correct part in hand, he explains.

That type of report can also be analyzed over time, allowing users to spot trends and identify vehicles that are getting too costly to operate.

The time spent just on manually gathering meter readings is nearly eliminated. "We no longer need to send Joe out to a customer's location to track down 75 forklifts to get the hour-meter readings," Russian observes. Furthermore, the data reporting software can answer other questions managers might not know they need to ask, he adds, "like why are these six trucks on the loading docks only getting 22-percent utilization, but six trucks that are the same model inside the warehouse get 87-percent utilization?" That kind of information lets managers optimize utilization and operator staffing as well as determine whether they have the right number and type of trucks.

At the same time, these systems' twoway communication helps fleet managers exercise better control over day-to-day operations. Furman cites Raymond's iControl module, which allows a supervisor to change an operator's driving profile. "Suppose you have newer operators and want to limit truck performance, including lift and travel speed, until those operators improve their skills through training and experience," he posits. "Historically, you would have had to make those changes to individual equipment trucksides. Now you can do it once, and their profile follows them with their key or swipe card, regardless of which vehicle they use."

Technology for all, big and small

The potential for all of these systems to improve cost, efficiency, productivity, and safety is undeniable. Still, there are some potential drawbacks. For example, drivers and maintenance technicians may be resistant to electronic oversight. The vendors have an answer for that: They say managers can address these concerns by emphasizing that the systems improve safety, make everyone more efficient, and ensure that they get paid for the work they actually do.

Another concern is whether users will be

overwhelmed by too much data. **Yale's Aitchison says that's one reason why his company customizes each system to provide customers with the specific combination of features they need. Regardless of the system provider, he suggests starting out with one area where users have the greatest need for information, and then adding more data collection and reporting capabilities over time.**

What about lift-truck fleets that include equipment from more than one manufacturer? The fleet optimization systems can perform basic tasks on other makers' trucks—they can even work on other types of electric-powered equipment, such as sweepers and AGVs—but their functions are much more limited. (Raymond, for example, offers only a harness-and-sensor setup for other manufacturers' equipment as well as for older Raymond equipment that is not iPort ready.)

And, of course, there is the cost. Vendors would provide only broad estimates, which ranged from a few dollars per truck per month for “power by the hour” agreements to about \$3,000 per vehicle for the most feature-laden systems. That may seem high compared to the \$20,000 initial cost of a forklift, but payback time is 12 to 18 months, they say.

Although you might think that these sophisticated systems are intended for only the largest operators, even fleets as small as 10 trucks are using them. “If you have only 10 trucks and one of them has an accident or downtime for maintenance,” Crown's Ranly points out, “that's a serious concern compared to one truck out of hundreds being out of service.”

All of the vendors interviewed for this article said they are excited about the technology's potential, not just from a sales standpoint but also because it offers the opportunity to develop applications that have never been feasible before. As Ranly puts it, “We've never had a tool like this that customers can use to change the way they operate their fleets. It offers a very tangible benefit, and they know this tool can help them.”

The Pioneers

Forklift manufacturers that offer comprehensive wireless fleet optimization systems are Johnnys-come-lately to the game. Independent software companies were the first to develop these systems, and some of the lift-truck makers have partnered with them to gain access to their Web-based reporting software and ability to communicate wirelessly with vehicles.

One of the pioneers in this area was Access Control Group (ACG), which was launched in 2000 to help customers improve safety by remotely controlling drivers' access to forklifts. Over the years, the company has added functionality that addressed problems engineers have observed at customers' warehouses, says CEO Arun Patel. According to Patel, ACG (www.assetor.net) was the first to offer Web-based management of vehicle data, which helped customers like Walgreens monitor data when managers were traveling to multiple facilities. ACG's Vigilant G2 system, which he says is priced below those of his competitors, manages operators' access and safety compliance, reports impacts, monitors vehicle utilization, and more. Patel says the company will introduce an RFID-based system for measuring operator productivity early next year.

Some of the other vendors of wireless lift-truck monitoring and management systems include:

- On-Board Communications (www.on-boardcommunications.com), whose LiftTraks GPS-based system tracks vehicles, monitors engine usage, schedules preventive maintenance, and monitors labor activity, among other functions;
- ShockWatch (www.shockwatch.com), which offers Webbased remote data management and monitors for impacts, vehicle usage, safety compliance, maintenance, equipment utilization, and more;
- I.D. Systems (www.id-systems.com), which offers Webbased remote data management,

monitors equipment utilization and operator productivity, controls vehicle usage based on maintenance and repair needs, and monitors all types of batteries, to name just a few of its functions; and

- Sky-Trax (www.sky-trax.com), which automates data collection for lift-truck drivers, and says its Real Time Location System for warehouse materials and vehicles is accurate within inches.