In sync:
Data capture and
mobile computing

Using a combination of diverse technologies—often in one compact package—gives users the edge in asset management and operational efficiency.

By Sara Pearson Specter, Editor at Large

With ongoing pressures to drive costs out of manufacturing and distribution processes, facilities increasingly rely on a blend of data capture and mobile computing technologies to gain better control of assets and inventory. The application of a single solution—such as RF bar code scanning, imagers, voice-directed picking or radio frequency identification (RFID)—developed into a blending of technologies embedded into a single device for maximum labor flexibility and operational efficiency.

Users need data capture and mobile computing solutions that generate enhanced supply chain visibility and overall business efficiency improvements, says Mike Liard RFID practice director at ABI Research (www.abiresearch.com). "To do that, suppliers have become more 'technology agnostic,' offering a broader range of automatic identification data collection (AIDC) solutions for use in combination as complementary technologies."

"The technologies are used not just to find assets, but also to track the mis-sion-critical things that get tied to your process," Liard adds. "People are looking beyond labor cost reduction to overall cost reduction—a more holistic approach."

Further, "there's been a trend to have devices that can operate 24 by 7 by 365, or with essentially no downtime," says Tim Eusterman, senior director of industry marketing for Intermec (www.intermec.com). "Companies call it 'sweating the assets,' and they're looking get the most utilization out of the least amount of investment in mobile computing."

Multi-modal capabilities

Feeling the pressure to run as lean as possible has companies examining every angle of their spending.

"Along with that, there's a reduction in information technology (IT) staff and IT spend," says Dave Peddemors, vice president of North American sales for Psion Teklogix (www.psionteklogix.com). "Users upgrade because they can't support their old systems any-

Wearable mobile computing devices are increasingly being enhanced with greater processing power and more memory to accommodate full color images that show a visual of the product to be picked, the correct location of a pick, or the appropriate scheme to follow in building a pallet load.

more; they may not have an IT staff person in every single location. So, companies are looking at modularity and the ability to deploy one platform across multiple applications."

In response, vendors are providing smaller, faster data capture and mobile computing devices with multi-modal functionality—combining RF scanning, imaging, RFID tag reading, voice-directed picking and other AIDC elements into a single unit. One device has one operating system, battery pack, holsters and modular accessories to

simplify management of the tools, Peddemors says.

A single, multi-modal device also offers flexibility, says Intermec's Eusterman. "Some mobile computers can be used on a forklift for receiving, putaway and replenishment, then can also be a wearable device for a voice picking application. Or, in a receiving situation, if a user is more comfortable with a pistol grip, that can be attached to convert the device to a hand held," he says.

More units are incorporating imager cameras as well, according to Motorola's

Mike Maris, senior director of transportation and logistics (www.motorola.com/enterprise). "Especially at the docks, the ability for a receiving clerk to take pictures of a delivery in real time, combine it with a voice recording, and send a message to the buyer to confirm the accuracy of the receipt through the mobile computer is a real timesaver," he says.

Browser-based interfaces

Operators of mobile computers have become quite familiar with browser-based navigation and smart

phones. Because of that inherent comfort level, warehouse devices are also sporting these interfaces—making them both more accessible to new users and easier to train employees on.

Additionally, warehouse management system (WMS) solution providers have begun offering the ability to present full color images on mobile computers—showing a visual of the product to be picked, the correct location of a pick, or the appropriate scheme to following in building a pallet load, to name a few.

To accommodate these features, "the devices have more processing power and more memory," says Keith Bernhardt, LXE's director of product management (www.lxe.com). "If you have a higher powered processor, you can deliver more commands faster for quicker traditional picking. If the device is a thicker client, you can't afford to slow down just because you have a few more features."

Look for newer devices to also sport higher resolution screens, says Psion Teklogix's Peddemors. "Vendors are developing high-visibility, high-resolution screens that represent the product very well and allow you to get a lot of legible, readable data in that screen factor," he adds.

Interconnectivity

Bluetooth technologies continue to be employed with mobile computing and data capture devices, says LXE's Bernhardt. "To enable the interaction of different equipment, Bluetooth connects scanners to vehicle mounted and hand-held computers, so operators no longer have to be tethered to a forklift," he says.

The technology also enables operators to wear hands-free devices, such as

To give users the ability to deploy one platform across multiple applications, mobile computing vendors are providing smaller, faster data capture devices with multimodal functionality.

ring scanners on their fingers or voice-enabled headsets over their ears, that communicate back to a computer worn on a belt. "That combination allows the wearer to be really mobile, more efficient, work faster and make the operations move much more smoothly," Bernhardt adds.

Also enhancing interconnectivity, says Tom Burke, vice president of product marketing at Datalogic Mobile (www.datalogic.com), are the location-based service technologies that can be integrated on mobile computing and data capture devices.

"The combination of global positioning systems (GPS) with cellular technologies and Wi-Fi positioning systems opens up a lot of opportunities to know

the position of a person relative to a position within a facility—without putting in an expensive, dedicated, location-based system," Burke explains. "These solutions also allow you to instantly know a vehicle location for tracking parcel deliveries."

The systems seamlessly maintain the wireless connection, enabling an appropriately equipped mobile worker to complete tasks inside the warehouse and then out in the yard.

For even more productivity, operators can be outfitted with a fast-output mobile printer that wirelessly networks with mobile computers and prints human-readable or bar code labels for shipping, returns or store location loading.

"If you outfit the worker with a mobile printer, you can really cut down on travel time to fixed printers and eliminate confusion in locating loads that are some distance away," adds Intermec's Eusterman.

RFID's re-emergence

Although still considered by some to be a four-letter word, RFID tags and reader use is exploding as a component of data capture for asset management—including inventory, work-in-process, parts, returnable packaging, tooling and vehicles, says ABI Research's Liard. While the trend is fueled partly by an increase in the technology's reliability and a corresponding decrease in per-tag and reader costs, companies are evaluating RFID based on return on investment and total cost of ownership.

"The value of the tagged asset is certainly going to come into play, but there's also the factor of preventing the loss of assets, or having trouble finding these assets during mission-critical times," Liard says. "The value proposition is tied to the business process and the larger efficiency picture."

With growing use of information-dense bar codes, data capture devices now incorporate imagers that have become as fast at reading them as laser scanners read a traditional one-dimensional bar code.

Warehouses and manufacturers are looking for mobile computing solutions that enable them to better manage inventory, assets and labor, agrees Toby Rush, president and CEO of Rush Tracking Systems (www.rushtrackingsystems.com).

Rush's company offers a solution featuring an RFID reader mounted to the top of the lift truck for indoor position monitoring and real-time visibility of the truck, and an RFID reader mounted on the front of the vehicle or on its forks automatically scans the load being moved. "By taking away the hand-held bar code scanner and not making a person scan, a facility can gain speed and accuracy by eliminating errors," Rush explains.

In addition to inventory and shipping accuracy improvements, users of these systems also benefit from analyzing the data collected to yield better labor and fleet management, adds Rush. "It's like having a little industrial engineer riding on every forklift, doing time studies all day long."

Information dense bar codes

With growing use of information-dense bar codes—such as two-dimensional (2D) versions that store information both horizontally and vertically, and compact GS1 DataBar (formerly known as RSS, reduced space symbology)—additional information can be stored in the mark. Application identifiers contain more information than ever before, such as serial numbers, lot numbers and expiration dates that yield better product identification, quality control and traceability.

To accommodate these bar codes, data capture devices now incorporate imagers that have become as fast at reading them as laser scanners read a traditional one-dimensional bar code, says Motorola's Maris. "The imagers are essentially cameras that take a picture of the bar code and translate the dots and squares; for traceability, it's a technology that's starting to find real purpose."

Computing in a cloud

With more WMS vendors looking to offer their software as a service (SaaS—also known as cloud-based computing), most mobile computing device manufacturers say the effect on their technologies will be negligible.

"Most devices now have an integrated browser and fairly high speed interface to the network," says Datalogic's Burke. "SaaS requires a certain functionality from your browser, and if you have an old one that hasn't been updated, you're going to have some compatibility issues."

It's also important to verify that the devices have the ability to lock the browser onto a single application, preventing users from accessing the Internet or control panel, as well as keeping the network secure.

Perhaps the biggest benefit of cloud-based computing will be the ability of a smaller level of user to take advantage of warehouse automation, says LXE's Bernhardt. "Certainly SaaS allows smaller deployments to take place in larger numbers," he adds.

For mobile computing and data capture device manufacturers, that will likely lead to an increased availability of pared down, more common configurations of products that don't require as much customization. "They're not going to be looking for so much specialization and variety, but will still find significant improvement in their operations overall," Bernhardt says. ☐

Location-based service technologies can be integrated on a device, allowing companies to instantly know a vehicle location for tracking parcel deliveries.