Analyst Insight

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A Sound Decision: Utilizing Voice Technology for Improved Productivity and Quality

The July 2009 benchmark, *Warehouse Operations: Increase Responsiveness through Automation*, discussed the performance of Best-in-Class companies and examined how their capabilities and technology choices differed from their Industry Average and Laggard peers. This Analyst Insight will provide a focused look into voice-enabled systems, one of the warehouse technologies that showed differentiation in adoption levels between the three maturity classes. Voice-enabled solutions direct warehouse staff as they perform their order fulfillment duties, and those respondents who are currently utilizing the technology have achieved a higher level of performance than their peers.

Analyst Insight

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The Impact of Voice Technology in Order Fulfillment

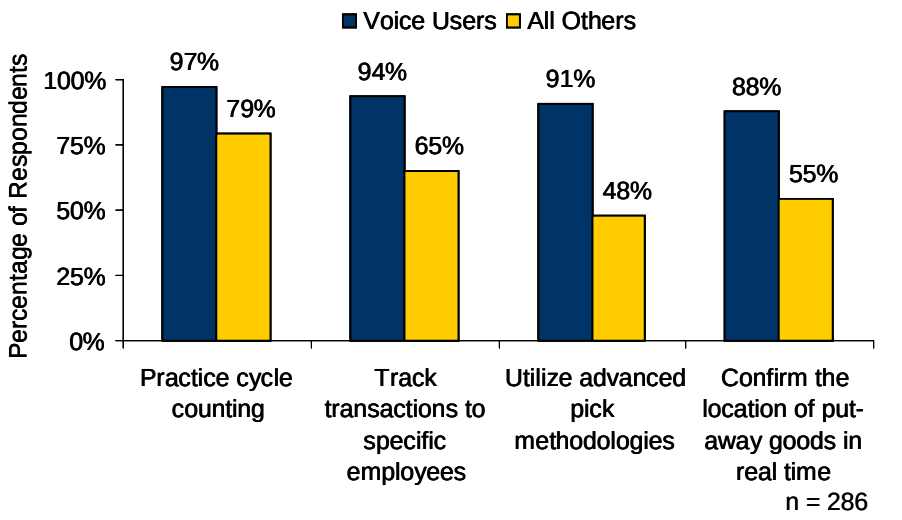
Across all warehouse functions—from receiving and put-away through picking and shipping—efficiency and accuracy are the bases for a top-performing order fulfillment operation. As illustrated in Figure 1, respondents who are currently utilizing voice technology in the warehouse are more likely than their peers to possess capabilities that support these important elements:

- Cycle-counting (18% capability gap) and real-time confirmation of item put-away (33% gap) help ensure that the underlying WMS has current and accurate information upon which to make decisions regarding order picking, replenishing the pick area from storage, and triggering replenishment orders from suppliers.
- The utilization of advanced picking methodologies (43% capability gap), such as cluster- or batch-picking, allow for better labor optimization through intelligent routing, increasing labor efficiency.
- Lastly, the ability to track warehouse transactions to specific employees (29% capability gap) not only creates a level of accountability, but can also provide a labor management system with requisite data to enable more intelligent task allocation/personalization, performance measurement, and on-going monitoring against established standards.

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Fax: 617 723 7897

Figure 1: Process Capability Gaps between Voice Users and Their Peers



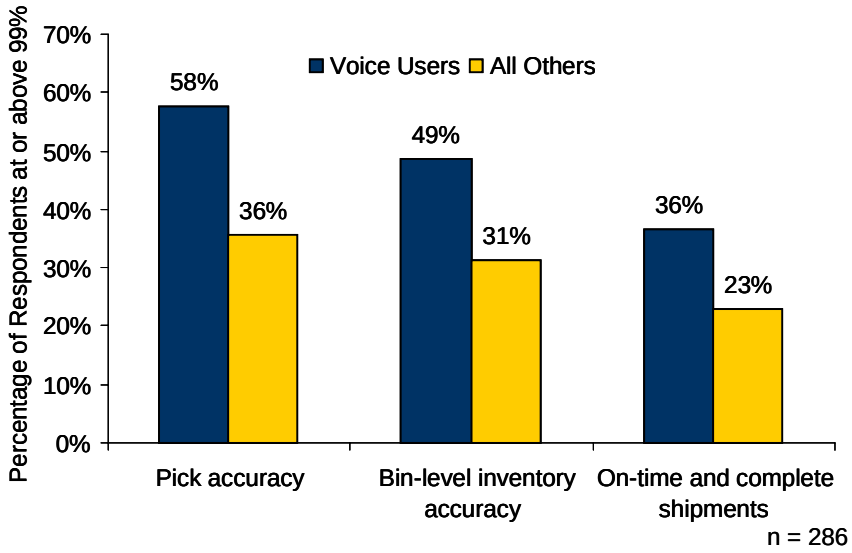
Source: Aberdeen Group, July 2009

While companies that have adopted voice-enabled warehouse technologies possess greater **process** capabilities than their peers, those differences would be meaningless without an accompanying advantage across **performance** metrics. As Figure 2 demonstrates, these companies do, in fact, rise above their peers in the areas of pick accuracy, inventory accuracy, and on-time and complete shipments from the warehouse. Improving inventory and pick accuracy can help minimize stock-outs, reduce the error costs of processing returns, and feed directly into on-time and complete shipments - the third metric where voice-enabled warehouses stand out from their peers. As illustrated below, voice users are:

- 1.62-times as likely as non-voice users to have pick accuracies of 99% or higher
- 1.55-times as likely as non-voice users to have inventory accuracies of 99% or higher
- 1.59-times as likely as non-voice users to have on-time and complete shipment rates of 99% or higher

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Figure 2: High-Level Warehouse Performance Comparison



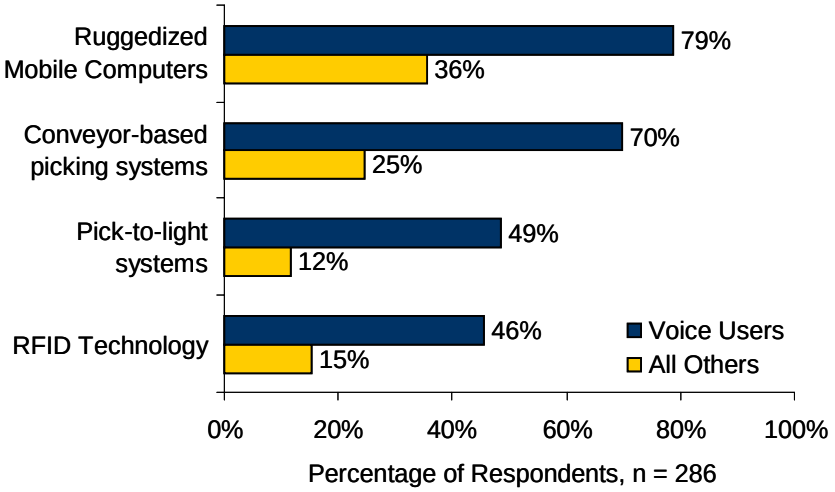
Source: Aberdeen Group, July 2009

Focusing solely on the use of voice-enabled warehouse technologies would present too simplistic a picture of these order fulfillment operations. Another notable aspect for these respondents is the level of adoption they display for complementary technologies. As illustrated in Figure 3, users of voice technologies in the warehouse are also far more likely than their peers to utilize ruggedized mobile computers (43% adoption difference), conveyors for picking (45% difference), RFID (34% difference) and even the technology against which voice is typically compared, pick-to-light systems (37% difference). These results highlight two salient, and related, points:

- First, successful warehouse operations are the product of no single piece of technology, but rather the intelligent design and seamless integration of multiple contributing elements
- Second, the true benefit of voice technology may come not simply as an incremental performance gain, but from its ability to catalyze system-wide improvement by interfacing with, and leveraging, various other supporting technologies

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Figure 3: Usage of Complementary Technologies



Source: Aberdeen Group, July 2009

The preceding analysis is based on the aggregate responses of all survey-takers, and the voice users cited above do not represent the adopters of any specific solution provider's offerings. For a look at one specific end-user implementation, we highlight the experiences of Black & Decker's Hardware and Home Improvement Group.

Case in Point: Black & Decker's Hardware and Home Improvement Group

The Black & Decker Hardware and Home Improvement Group (BDHHI) encompasses four well-known brands, including Kwikset, Weiser Lock, Baldwin, and Price Pfister. It operates two mid-size distribution centers in the United States: a facility in Mira Loma, California and the other one in Charlotte, North Carolina. Between the facilities, BDHHI conducts fifteen to twenty-thousand picks each day, supporting direct-to-store, direct-to-consumer, and traditional customer DC shipments to both domestic and international locations. With the majority of its picks coming in cases and eaches, efficient picking operations are of great importance.

The major focus for implementing voice was productivity. According to Steeve Proulx, Sr Manager Supply Chain IS and David Konopka, Sr Manager, Distribution Technology at BDHHI, "This was what we were going after: to increase our picking productivity. This was the main focus of going to voice picking." When it came to selecting a vendor, they valued Voxware's device independence. "We were already using LXE equipment. If we would have gone with [a competing voice provider,] we would have had to buy their devices. But for us, that was cost-prohibitive. If you already have the equipment, you just need licenses and headsets and you're good to go. This was a major aspect that helped us make our decision."

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The systems integration of the voice solution with BDHHI's existing systems went smoothly. "This was probably the easiest part of the implementation," says Proulx. On the process side, they had a goal to not alter any existing processes. They formed a five-member team to learn the system and serve as guides for a pilot program. "Going to the floor, we knew that there would be some resistance to change," says Konopka. "So we conducted a pilot to show people how it would work. In the end, the five pickers we brought onto the pilot became sponsors that spread the word out on their own – and that created an environment where people couldn't wait to be a part of it."

Proulx also noted taking advantage of the configurability of the Voxware 3 offering to tailor processes at their facilities. As one example, BDHHI improved their workflow with the new technology in their Baldwin business, where they deal in mostly each picks. Using batch carts, workers are sent out to multiple locations to pick multiple orders. In the past, this would require the worker to manually sort out multiple labels, do their own cubing logic, arrange elements on each cart and then proceed to their pick assignments. Moving from RF to voice technology gave them the flexibility to build out custom Graphical User Interfaces (GUIs) for their users, allowing them to automate the cart setup, with all items pre-positioned. "The cart-building is so much easier now," according to Konopka, "the only thing the picker needs to do is grab the cart and voice his or her assignment."

BDHHI has realized benefits across many areas, including their main focus: productivity. "This has helped us significantly in terms of picking productivity, and the ROI was easily justified," says Proulx. "This is recognized as one of the most successful projects in Black & Decker HHI." They have also seen a "significant and very positive impact" on quality, noting a decrease in Defects Per Million Opportunities (DPMOs). The improvements have extended into their employee on-boarding process as well; it now takes only one to two days to get a new user up and running on the voice system, as compared to one or two weeks for their previous RF system.

BDHHI is looking to expand its use of voice technology moving forward, and to leverage its configurability to tailor additional workflows in the future. According to Konopka, "we have seen significant gains that have convinced us that this is a solution that we should apply to other functions of our distribution model." They are looking to expand voice into other steps in their order fulfillment process, including put-away and replenishment. They are also looking to expand the coverage area of the voice solution by shifting cycle-counting responsibilities off of their WMS and onto Voxware's application.

Solution Snapshot

Voxware is a provider of device-independent voice applications for the warehouse, covering functions including put-away, picking, replenishment

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and loading. Voxware solutions also include a management dashboard (VoxConsole), a process workflow design tool (VoxStudio) used to configure the voice solutions, an integration application for WMS, ERP and order management systems (VoxConnect), as well as a set of portability / expandability tools (under the heading of the Adaptive Voice Framework). Voxware has established partnerships with numerous solution providers, including mobile device manufacturers, WMS developers, material handling equipment providers and systems integrators.

Key Takeaways

Managers and executives looking to boost warehouse performance using voice-enabled technologies should consider the following:

- **Ease of integration.** In order to implement the processes highlighted in Figure 1, such as advanced pick methodologies and employee-level tracking, a voice system must effectively interface with your existing system(s). As such, evaluate each prospective solution provider based on their solutions ability to interface not only with your current WMS/SCM, but across many offerings. This will both highlight the maturity of their integration architecture and also provide a measure of comfort with regard to future system changes.
- **Return on Investment (ROI).** Although voice users achieved higher inventory and pick accuracy, as noted in Figure 2, improved performance metrics do not necessarily lead to better financial results. Analyze each vendor's ROI case in terms of your specific processes. If your organization can respond to and fix picking errors with little cost, then an ROI based on stellar pick accuracy will not be very enlightening. Push the vendor further, to ensure that their value proposition aligns with the true pressures you are feeling in the warehouse.
- **Supporting technologies.** Explore complementary technologies–and vendors–to provide a comprehensive picture of available solutions. As illustrated in Figure 3, operations currently employing voice-based technologies also display higher adoption rates of other related technologies. Voice systems pair well with ruggedized mobile computers, RFID, traditional barcode scanners, and multi-modal devices that combine these functionalities within a single unit. Vetting the respective vendors for these solutions early on will also allow you to evaluate the interoperability of specific hardware solutions, providing the same forward-looking security as with the software solutions cited above.
- **Scope of implementation.** Not all solutions are appropriate for all inventory profiles, and not all implementations need to span the entire operation. Analyze different inventory segments (fast-movers versus slow-movers, steady demand versus seasonal) to identify the best approaches or handling those materials. Intelligent design in the

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warehouse can lead to separate pick areas employing different technologies, but ultimately leading to the best overall balance of performance and cost.

As demonstrated by the performance differences noted by end-user respondents, in the right environment voice-enabled warehouse technologies can offer significant improvements over traditional order fulfillment operations.

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Related Research	
Warehouse Operations: Increase Responsiveness through Automation; July 2009 Five Key Steps to Optimizing Warehouse Management; February 2009	Distribution Center Strategies for Today's Economy: Managing Growth Without Adding Labor or Space; November 2008 Warehouse Automation: How to Implement Tomorrow's Order Fulfillment System Today; October 2008

Authors: Bob Heaney, Senior Research Analyst, Supply Chain Management (bob.heaney@aberdeen.com);
Scott Pezza, Research Associate, Supply Chain Management (scott.pezza@aberdeen.com)

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