

Aberdeen Group
A Harte-Hanks Company

Voice Technology Meets the eCommerce Distribution Challenge

April 2011

Bob Heaney

Sector Insight

Aberdeen Group
A Harte-Hanks Company

April, 2011

Voice Technology Meets the eCommerce Distribution Challenge

In October and November of 2010, Aberdeen surveyed 158 warehousing professionals for a benchmark report *(Warehouse Management Excellence: Maximizing Resources and Efficiency*) that explores the pressures these companies are facing and what plans they have for the coming months. This Sector Insight focuses on one specific segment of warehouse professionals - voice users, or those companies that have, or plan to invest in, voice technology in their operations in the next 12 months. How are these 31 companies coping with present economic conditions, what capabilities do they have, and what technologies do they rely on to ensure efficient operations and provide value to their customers?

The Advantage of Voice

In today's environment a predominant pressure companies are experiencing is a need to reduce warehouse operating expenses while maximizing utilization of resources. In order to achieve this goal, companies are looking to understand better their performance, current capabilities and use of enabling technologies. The goal is both to increase efficiency of software and automation across the entire distribution network and to improve alliances with internal and outside parties to allow for better planning of physical space/locations and labor, and to justify and prepare for the future, in terms of potential investments and ROI expectations.

From our November findings across 158 companies, 14% of companies have already deployed voice enabled warehouse management technology to drive improvements in operational efficiency. And in aggregate about 20% (a total of 31 companies (which we will call the voice users) have and /or plan to invest in voice technology in the next 12 months. Overall, across all companies on the topic of warehouse management, Aberdeen found that two of the top three business pressures centered on efficiency and resource management "doing more with less." With respect to the top pressures for the voice users alone we see that they exactly mirror the full sample across all companies with regards to "doing more with less." Specifically both voice and no voice groups have identical percentages (Figure 1) on the pressures or need to:

1. *Support increased sales without increasing staff or space* (46% of voice and all companies)
2. *The need for better utilization of underutilized resources* (31% of voice and all companies)

Sector Insight

Aberdeen's Sector Insights provide strategic perspective and analysis of primary research results by industry, market segment, or geography

Sector Definition

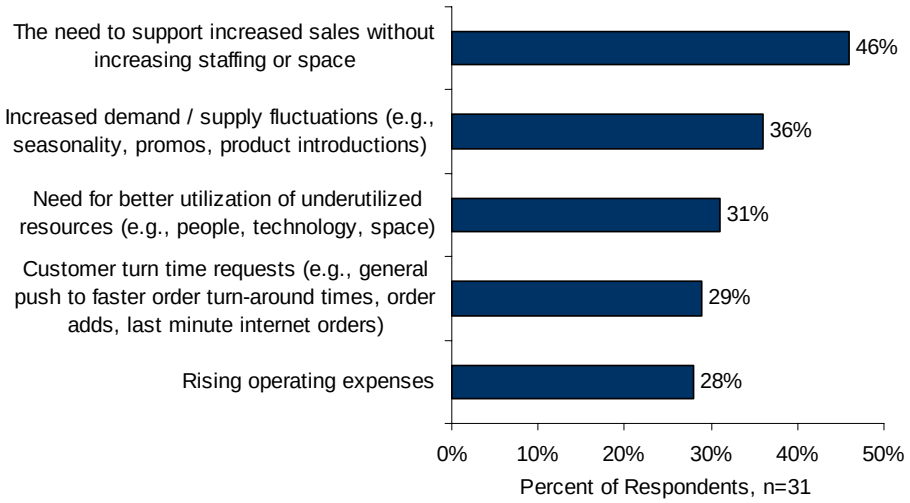
This document is focused on the **current and planned voice users -** a total of 31 companies out of 158 enterprises from the *Warehouse Management Excellence: Maximizing Resources and Efficiency* report.

Both voice and no voice companies have virtually equal percentages by organization type:

- √ **44**% - Original manufacturer
- √ **30**% - Distributor /Wholesaler
- √ **19**% - 3PL
- √ **15**% - Other
- √ **10**% - Retailer
- √ **10**% - Freight Forwarder, Customs broker
- √ **6**% - Supplier Manufacturer / Supplier

This document is the result of primary research performed by Aberdeen Group. Aberdeen Group's methodologies provide for objective fact-based research and represent the best analysis available at the time of publication. Unless otherwise noted, the entire contents of this publication are copyrighted by Aberdeen Group, Inc. and may not be reproduced, distributed, archived, or transmitted in any form or by any means without prior written consent by Aberdeen Group, Inc.

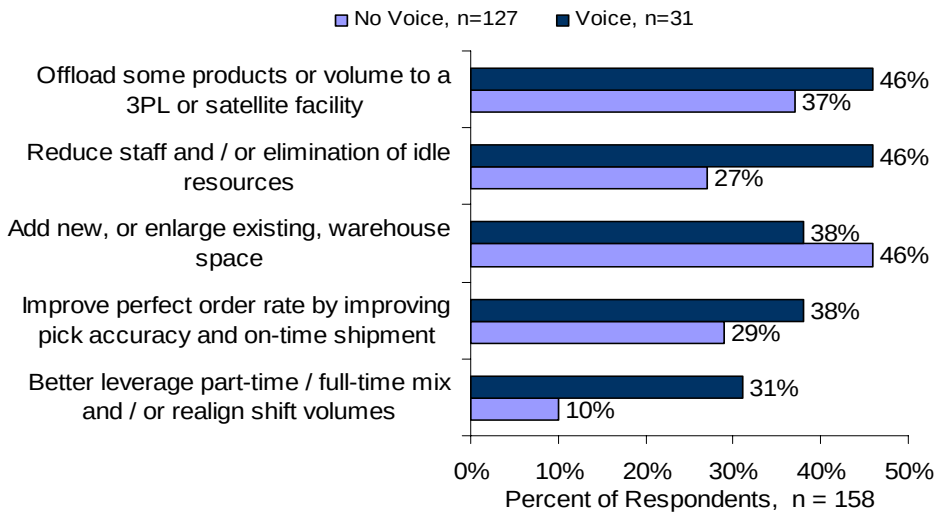
Figure 1: Top Pressures Current and Planned Voice Users



Source: Aberdeen Group, November 2010

The top two pressures are identical, but we begin to see some separation of focus when it comes to the top actions of voice users vs. others (Figure 2).

Figure 2: Top Actions for Voice Users



Source: Aberdeen Group, November 2010

From the actions they are taking (Figure 2) let's focus on the three where voice users have the highest priority gaps and are more focused than the others:

- 3.1-times as likely to better leverage part-time / full-time mix and / or realign shift volumes

© 2011 Aberdeen Group.

- 1.7-times as likely to reduce staff and / or eliminate idle resources
- 1.3-times as likely to improve perfect order rate by improving pick accuracy and on-time shipments

It is clear that the voice users are more engaged, placing from 1.3-times to 3-times the level of focus in balancing and optimizing labor to address volumes and mix, to reduce waste, and to balance that with picking and shipping accuracy. Since labor comprises over 35% of the full operating budget, labor is a clear focus for all respondents but is highest for those operations with lots of each-picking and a variety of order types to handle within their warehouse operations. To further illustrate the challenges and opportunities of labor optimization under large growth in SKUs we will now examine the transformation that recently took place at an eCommerce facility.

E-Commerce DC Triples Throughput and Delivers Fast ROI, Moves from Paper to Voice-Directed Consumer Delivery

The world's largest supplier of party goods originally used one of its DCs to provide dedicated truckload deliveries to more than 220 of its retail outlets in 21 states. But in 2009 there were plans to significantly increase the scale of items and throughput by phasing out retail store delivery from this facility and converting the DC to direct-to-consumer parcel delivery for its booming Internet commerce platform.

The New Operating Requirements

While it was apparent that operations would change substantially, the full impact on throughput and labor productivity under the old system of operations was unclear. Beginning in April of 2009 the facility, in support of company plans, began to phase out of retail outlet delivery and phase in web orders with direct-to-consumer parcel shipments. The DC moved from the original product line to additional product lines to support the web presence. Not only did the number of web SKUs active on a typical workday grow – from approximately 3,200 SKUs to around 12,500 SKUs – the order volumes the facility had to handle surged during the peak season (of Halloween 2009) to 115,000 orders. One additional requirement of the web order SKUs that went direct-to-consumer was that orders placed by 1:00 pm needed to be shipped the same day.

"The facility was challenged with the old label-based and label directed picking system, which was inadequate to sustain the planned volumes. Significant temporary process reengineering and a virtual tripling of temporary staff was required just to muscle through the peak season," said Ed Plesa, Vice President of Supply Chain Management. "Not only that, our 2010 plans called for more web items; incremental web channel sales were budgeted to increase by more than three times by peak Halloween season 2010. To absorb this volume while optimizing our costs, a major transformation of our distribution operations was required. We needed to

© 2011 Aberdeen Group.

go to dynamic picking, which required a phase-out of our predominately paper-based picking environment," Plesa continued.

The full catalog of web SKUs includes approximately 35,000 items and the addition of this e-commerce volume to the base facility was the primary requirement to restructure the process and streamline operations.

The Reengineering Process - Addressing the Challenge

To address the challenge, the company embarked on a strategic alliance with Wynright and Vocollect. Following a series of site visits, in March of 2010 the reengineered operation began to take shape, with the introduction of additional carton flow lanes, conveyors, dynamic picking and put areas, new envelope processing, and packout to parcel lanes. To accomplish the transformation, the company introduced new streamlined processes in a phased go-live by order type from July through September of 2010. The challenges by order type varied, but in every case, the goal was to reduce travel and inefficient activities in favor of a move from batched, paper-based picking to dynamic voice- and RF-assisted picking.

A Summary of the New Process by Order Type

As part of the transformation process, close attention was paid to the various order types handled within the facility as well as the requirements for the new Internet order picking volumes. A summary of process steps by order type is listed below:

1. *Pick-to-shipper orders* – batched by work area (up to 200 orders per wave) the associate uses voice and RF to pick multiple orders in batches via cart, directly to shipping container. This area requires up to 25 FTEs at peak and is about 50% of orders at peak, but 15% of orders non-peak.
2. *One-zone orders* – a single discrete order batched by work area (up to 200 orders per wave). The process involves enhanced discrete picking, where the full order of one or more items can be satisfied in one pick zone and placed on a takeaway conveyor. This area requires up to five FTEs at peak and about 10% of orders at peak, but 15% of orders non-peak.
3. *Multi-order to multi-zone* – orders that require items from multiple zones are batched by product within each home zone, are voice and scan-confirmed, and then travel from the home zone to 11 put pods, where voice-directed picking and RF confirm controls put to up to 20 orders per POD. Each order is pre-batched within a wave to reside in one put POD. As items flow into each pod they are placed in bin positions (each bin represents one order) that reside on moveable carts. Once the put-wave is complete, the carts of completed orders flow to a combined QA and pack station and items are scanned into shippers and labeled. This multi-step pick-put-pack process requires up to 100 FTEs at peak.
4. *Supertote orders* – all single line item orders that will ship in envelopes (balloons, costumes etc.) are batched into supertotes. The associate

© 2011 Aberdeen Group.

voice-and-scan-confirms each pick item from their home zone into supertote, along with other pick items from the same zone. The supertote goes to a dedicated speedpack station, where a packer scans the tote and then scans each item out of tote to dynamic-print a packing slip and envelope label. This area requires up to 35% of FTEs or 10 FTEs, but only one FTE under normal volume.

Before the transformation initiative, each type of order was batched and picked via paper without extensive RF scanning (only some RF was present prior to integration and with no voice). But under the new system, all picking involves scanning combined with voice integration. At the operator level, the activity involved is a combination of scanning and voice-directed, where the operator scans totes and shipping cartons to identify specific orders and confirms each pick (via UPC scan) to tote or shipping carton. Within the new pick pods, an operator is voice-directed to a specific POD to locate products and scans his or her UPC to verify and ensure accuracy as each product is placed (called a 'put') into a bin to continue each picking phase. As order types are audited, packed and labeled as complete, they are shipped directly to the end consumer.

In particular, multi-order to multi-zone, the largest unit volume process, required that the operation move from pre-printed labels to dynamic RF and voice operations. In the old system, all product picking was picked to label; however, the new process integrates a combination of RF UPC scanning and voice into a multi-stage process, which has lead to labor productivity and accuracy improvements.

Project Benefits and ROI

To get an idea of the overall benefits of the operation some of the productivity, audit and ROI benefits are indicated below:

- **6-month ramp up** - full conversion, ramp-up and training was completed in time for the peak
- **56**% increase in orders per hour
- **16**% increase in units per order - this was complemented by the fact that the suggested selling that took place on the web items
- **78**% increase in units per hour picked - in October 2010, the company went from 22.8 units per labor hour to 40.6 (all hours include picking, putting and audit functions)

The new system is scalable, with about 56% of the annual volume occurring during the Halloween season. "Cyber Monday this year involved a three-fold increase versus the trend where 95,000 units in one day were ordered in a multi-zone. We could not have done this without adding voice headsets, putpod carts and stations, and dynamic wave-picking," Plesa said.

Depending on the type of order involved, there was also a reduction in Quality Assurance (QA) activity, as one-to-one confirmation takes place in the new system on direct and speedpack. While final audit occurs for multi-

© 2011 Aberdeen Group.

pick/multi-zone items, there was a reduction in labor due to the QA being eliminated for the other pick types. Overall QA staff is up to 50% less than it would have been, had the operation continued in the old process after absorbing the web volume.

Voice ROI in Less than One Year

Overall, when the project was justified, it was assumed that all project components hardware, software, and process change would take place, yielding a 1.8 year ROI payback. "Actual results to date have resulted in overall productivity levels that can result in a payback within 1.5 years. However, it should be noted that the voice functionality component yielded a payback of less than a year. The workers have been very receptive to the change, and have embraced it in a fashion capable of the quick ramp-up we needed in advance of the 2010 holiday season. We also estimate that, operating under the old system, this additional volume would have incurred an additional cost of $400,000 during the holiday season alone," said Plesa.

Complexity Drives Dynamic Execution

In our recent survey we identify picking across five different categories (Table 1). With the exception of the first category discrete order picking, we see increasing levels of system and process dependency on more real-time technologies both hardware and software within the warehouse.

Table 1: Order Picking Capabilities Compared

Picking Capabilities	Voice n=31	No Voice n=127
Discrete Order Picking (One person picks one complete order at a time) – 1.25x	71%	76%
Cluster Picking (One person can pick multiple orders at the same time) – 1.66x	60%	65%
Zone Picking (Multiple persons pick portions of the same order) -1.33x	51%	75%
Batch Picking and Put (pick the supply of a SKU that is needed, and then distribute it to multiple orders or interim containers) – 1.81x	38%	48%
Dynamic Realtime order dispatch (ability to interleave order adds or quantity changes to already planned or in-process picks / puts) – 2.19x	22%	31%

Source: Aberdeen Group, November 2010

The example from the case study clearly illustrates that complexity and volume increase creates a need for more dynamic and flexible processes and more real-time technologies within the warehouse. The move from label-based picking to voice-directed picking is a technology option that companies (from simple to more complex) should explore to address the

© 2011 Aberdeen Group.

various order types within their facilities. As we can see from the example highlighted, voice companies are more aware and more prepared to address the labor and process complexities across order types, volumes, and shifts where they are 1.3-times to 2.19-times as likely as their peers to have capabilities in place to handle the various order processes required of their operations.

Beyond picking, there are numerous other activities within the warehouse that require different flows in support of a range of process flows in the picking operation. For instance, in our case study, there are numerous replenishment points where inventory is dropped in support of the various picking zones, whether they are discrete zone or multi-zone and pick-to-shipper versus put-to-tote. In our recent survey we identify replenishment across five different categories (Table 2).

Table 2: Replenishment Capabilities Compared

Replenishment Capabilities	Voice n=31	No Voice n=127
Min / max replenishment (A replenishment is triggered automatically when inventory levels fall below a pre-set minimum) – 1.25x	86%	69%
Demand-based replenishment (A replenishment is triggered automatically when inventory levels are not sufficient to meet the demand in a given day) – 1.23x	93%	56%
Top-off replenishment (Each bin can be automatically replenished to its "full" state regardless of minimum levels or demand) – 2.63x	65%	49%
Hot replenishment (An unexpected shortage can trigger an immediate replenishment of a given bin) – 3.16x	65%	36%
Hold replenishment tasks and release only when it is known that required amount will fit into the pick location - (time replenishment to coincide with picking) – 3.00x	46%	21%

Source: Aberdeen Group, November 2010

Again, we can see from the table that voice companies are more aware and more prepared to address the labor and process complexities across order pick and replenishment types where they are 1.2-times to 3-times as likely as their peers to have capabilities in place to handle the various order replenishment processes required of their operations.

The number of order and process flows required increases dramatically as the complexity and volume increases and can justify a move to more real-time, dynamic and flexible technologies such as voice. These technologies are more advanced than they have ever been and up to 39% of all

© 2011 Aberdeen Group.

respondents from the November study indicate that these technologies produce benefits allowing them to self fund in one year. One caution for companies as they explore these options is to diligently explore their volumes and process flows by SKU, channel and order type. Voice technology alone is not always the answer: companies must look to process first and, as in our case study, devise an overall automated solution complete with layout or sizing of new zones, introduction of "put areas," conveyors, printers and a variety of supporting investments. Only when the streamlined process and integrated automation solution had been carefully planned was it possible to layer in the voice components to bolster efficiency and accuracy. Planning an integrated solution and embracing these technologies allows companies to move off of constrictive label-based processes and to move picking, replenishment and other functions within the warehouse to new levels of efficiency and agility.

Required Actions

Whether a company is trying to move its performance in warehouse management and resource utilization to new levels or simply wants to reduce its labor costs or increase its order flow, the following actions will help to spur the necessary program success:

- **Improve overall picking processes.** Picking activities in our survey encompass over 50% of the direct labor and 35% of the operating budget. Best-in-Class companies at 75% are 3.2-times as likely as Laggards to utilize zone picking (multiple persons pick portions of the same order). Laggard companies at only 23% have a lot to learn from the example of leading companies (see case study) about how they can streamline process to flow cartons across pick zones through software and hardware reconfigurations. Many times this is simply a matter of using features available in software already owned or adding an incremental item or two.
- **Address complexity with automation**. While it is not always the answer automation can lead to improved efficiency and allow a company to grow into multiple order and process flows within its operation. As we saw in this study, voice users are anywhere from 1.2-times to 3-times as likely to handle overflows across all category types from discrete to dynamic. Additionally, the voice users were equally as likely to support their picking operations across the five categories of replenishment that are required in support of their extended picking zones and operations.
- **Apply rigor to the ROI justifications**. As we indicated earlier complex operations require diligence in preparing a rigorous reengineering and ROI justification plan. Companies do not simply triple the volume and complexity by rolling automation into the mix. A successful business transformation requires careful volume, channel, and order level analysis and planning. Focus should be placed on streamlining processes first, applying appropriate

"Actual results to date have resulted in overall productivity levels that can result in a payback within 1.5 years. However, it should be noted that the voice functionality component yielded a payback of less than a year. The workers have been very receptive to the change, and have embraced it in a fashion capable of the quick ramp-up we needed in advance of the 2010 holiday season. We also estimate that, operating under the old system, this additional volume would have incurred an additional cost of $400,000 during the holiday season alone."

~ Ed Plesa, VP Supply Chain, Large Party Retailer

© 2011 Aberdeen Group.

technologies in an integrated fashion (use an integrator or ask your solutions provider to assist), and final putting together a detailed multi-year year ROI justification that is conservative but consistent with company requirements. A proper plan should demonstrate payback within two years with some components yielding less than a one year payback.

For more information on this or other research topics, please visit www.aberdeen.com.

Related Research	
Warehouse Management Excellence: Maximizing Resources and Efficiency, November 2010	*On-Time and Under Budget: Maximizing Profits with Efficient Warehouse Management;* December 2009
Robotics going Mainstream: Improve Warehouse Productivity and Safety; September 2010	*Warehouse Operations: Increase Responsiveness through Automation;* July 2009
International Transportation: Optimize Cost and Service in a Global Market; July 2010	*Five Key Steps to Optimizing Warehouse Management;* February 2009
Labor Management: Instill Accuracy, Efficiency, and Productivity in the Warehouse and Retail Store; March 2010	

Author: Bob Heaney, Senior Research Analyst, Supply Chain Management (bob.heaney@aberdeen.com)

For more than two decades, Aberdeen's research has been helping corporations worldwide become Best-in-Class. Having benchmarked the performance of more than 644,000 companies, Aberdeen is uniquely positioned to provide organizations with the facts that matter — the facts that enable companies to get ahead and drive results. That's why our research is relied on by more than 2.5 million readers in over 40 countries, 90% of the Fortune 1,000, and 93% of the Technology 500.

As a Harte-Hanks Company, Aberdeen's research provides insight and analysis to the Harte-Hanks community of local, regional, national and international marketing executives. Combined, we help our customers leverage the power of insight to deliver innovative multichannel marketing programs that drive business-changing results. For additional information, visit Aberdeen http://www.aberdeen.com or call (617) 854-5200, or to learn more about Harte-Hanks, call (800) 456-9748 or go to http://www.harte-hanks.com.

This document is the result of primary research performed by Aberdeen Group. Aberdeen Group's methodologies provide for objective fact-based research and represent the best analysis available at the time of publication. Unless otherwise noted, the entire contents of this publication are copyrighted by Aberdeen Group, Inc. and may not be reproduced, distributed, archived, or transmitted in any form or by any means without prior written consent by Aberdeen Group, Inc. (2011a)