

**APPLYING
VOICE
TECHNOLOGY
TO MULTIPLE
DC WORKFLOWS
FOR GREATER
PRODUCTIVITY**

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BRIEF OVERVIEW

Maximizing distribution center (DC) and warehouse utilization while consistently maintaining peak performance levels are common goals shared by all operations, regardless of their size. To accomplish these objectives, it's critical to start by identifying and evaluating each operation's unique business requirements and finding solutions that address their most common challenges. Voice technology is a robust solution that consistently delivers business results in multiple workflows in a wide variety of essential DC processes and workflows.



BUSINESS CHALLENGES IN THE DC

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While DCs and warehouses of all sizes face many of the same challenges, small- to medium-sized operations (between 100,000 and 500,000 sq. ft.) tend to feel them most acutely. Numerous external factors — such as customer expectations, SKU proliferation, expanding networks and the pace of innovation — affect every level of the supply chain.

E-commerce necessitates offering a wider range of product and a subsequent increase in single-item picks. These place pressures on store, customer-facing and fulfillment operations to deliver greater variety with shorter lead times and in smaller quantities — coupled with an increase in customer expectations relating to returns. All of this requires more effort and adds complexity to the average order.

For many operations, analog or paper-based systems are still a big part of everyday tasks and workflows. This methodology is highly prone to process errors and severely impairs receiving, inventory counting, picking and packing workflows. Companies are taking paper out of the equation and employing automation solutions such as radio-frequency (RF) scanners, light- and voice-directed picking, mobile computers and scanners to drive efficiency and accuracy improvements.

This white paper explores how adopting voice technology across multiple workflows within the same operation can make significant impacts on accuracy and productivity, regardless of a facility's size or processes.



WHY VOICE IS THE OPTIMAL TECHNOLOGY SOLUTION

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Frequently, when small- to medium-sized operations consider implementing voice technology as an alternative to paper-based, pick-to-light or RF scanner solutions, they often believe erroneously that their business is too small, or that voice is too expensive.

However, according to Gartner Research:

“Voice-directed warehouse management solutions involve the use of speech recognition and/or speech synthesis technologies to drive activities in warehouse operations, integrating speech-collected information into a warehouse management system (WMS) or other database. This enables hands-free operations for tasks such as carton or ‘eaches’ (single-item) picking, where the additive data collection steps can be removed with the use of speech input. This provides 40% to 50% improved productivity for a similar task that, historically, required paper-based or barcode data collection.



“Enterprises that use speech recognition applications to replace paper-based picking or pick-to-light solutions can achieve ROI in less than one year. Other applications in the warehouse that can also use speech recognition include receiving, shipping, put-away, and cycle-counting and/or inventory management, and the payback on these implementations is getting more attractive with the elimination of specific-use data collection devices.”⁽¹⁾

Use cases for voice technology are fairly well-understood, and technical barriers to adoption are pretty much nonexistent. What’s more, the once-high costs of adopting voice are now on par with other technologies.

⁽¹⁾ Gartner. Revisit Your Ruggedized Strategy Before You’re Hit by the End of OS Support. Leif-Olof Wallin, Stephen Kleynhans, et al., Published 27 March 2017.

Voice Return on Investment (ROI): Primary and Secondary Benefits

No business is going to invest in something that does not have a clear return on investment (ROI). While some investments in technology, such as voice, have a shorter payback, what is more significant for businesses today is the total cost of ownership, or TCO. Businesses should partner with a trusted vendor to help assess technology requirements, as well as fully outline both initial and long-term costs — such as looking beyond the initial investment and considering lifecycle maintenance costs. For example, if a bring-your-own-device program is deployed, can associates' phones withstand a rugged environment? There are significant cost implications when investing in new technology, so selecting the right vendor partnerships is just as critical as the selection of the technology itself.

An experienced vendor can help an operation identify the real and quantifiable ROI of a voice investment. The primary financial benefits are centered on:

- **Accuracy** – Errors are reduced by providing a hands-free, eyes-up technology that keeps workers focused on the task at hand. There is no longer the distraction of looking at a screen or a piece of paper to know where to go or what to pick next. Workers are directed via voice through the entire process, allowing them to be more alert and aware while performing any number of tasks.
- **Productivity** – Because voice-directed workers are more focused on the tasks they're performing (and not having to stop or pause to look at a screen or a piece of paper), each associate is more fluid in his/her movements and able to move more efficiently throughout their assignments. Fewer steps to complete tasks throughout the day — less fumbling or struggling with other forms of information — reduces idle time, leading to faster warehouse throughput.

The secondary benefits of implementing voice within a DC include:

- **Labor efficiency** – The use of voice and the subsequent increase in overall worker productivity lead to additional savings, including: reduction in overtime; the need for fewer inspectors to check order accuracy; less reliance on temporary or seasonal staff; and the ability to cross-train employees to perform more voice-directed tasks.
- **Safety** – The hands-free and eyes-up nature of voice creates a more alert and aware workforce, helping to decrease the chance for injury. This also leads to less damage and breakage, which ultimately can lead to other incidents or injuries.
- **Regulatory** – To comply with evolving government regulations, voice allows operations to achieve cost-effective compliance for real-time material tracking and traceability without burdensome process or cost.
- **Inventory and downstream savings** – Reduced inventory holding costs are a direct result of the ability to create a more efficient fulfillment cycle from the receiving dock to the outbound shipment, reducing mis-picks and moving product at the right time to meet customer demand.

IMPACT OF VOICE ACROSS AN ORGANIZATION

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No two companies determine the cost or definition of a picking error in the same way. Some need to retrieve, inspect, and re-inventory improperly delivered items, while others simply may write off the incorrectly delivered goods. Some are sensitive to the cost of downstream lost sales, as deliveries are being made to company-owned retail outlets. Others calculate their costs per order (per delivery) instead of accuracy per line item.

The following information illustrates examples of frequently reported expense categories. While not exhaustive, they serve as a good model of cost areas relating to order errors that can add up and account for large buckets of operating costs if not tracked or improved. Many of these directly impact the workers using the voice systems and can be measured more easily. Other impacts are upstream or downstream and can provide additional savings opportunities but may not be as easy to track.

According to one supply chain consulting firm, a mis-pick, for example, can cost a wholesaler in the range of \$8 to \$40 per error:

“The cost is based on the error being correctly identified and reported followed by the costs for the clerical effort of handling the credit claim, the margin on the lost sale, the transport costs of returning the item, the labor costs in handling the return, and in some cases, the cost of writing off stock if the returned item is outside acceptable shelf life or QA parameters.”

An indication of the magnitude of possible savings for a wholesaler:

Cases Picked per Week	Error Rate	Errors per Year	Cost per Error	Total:
500,000	Two per thousand (99.8% accuracy)	50,000	\$15	\$750,000



After an 80% reduction in errors:

Cases Picked per Week	Error Rate	Errors per Year	Cost per Error	Total:
500,000	0.4 per thousand (99.96% accuracy)	10,000	\$15	\$150,000

By reducing the errors picked per year, there would be an annual savings of over \$600,000.

²Voice-directed Picking: Expected ROI, Business Computer Projects, Ltd., Chris Pass, 2015.

When looking across an organization, voice can prevent myriad costs, including:

Administration Costs

- Time spent working with customers, validating errors, and determining the proper course of correction
- Time spent re-issuing orders to correct errors
- Time spent adjusting existing invoices, issuing credits, and documenting account actions
- Time spent administering the return material authorization (RMA) process

Warehouse Costs

- Time spent re-picking orders
- Time spent re-packing orders

Transportation Costs

- Time spent re-delivering orders
- Time spent collecting RMA items
- Return freight expenses for RMA returns, as applicable

Restocking Costs

- Receiving returned items, updating RMA information
- Inspecting returned items and deciding re-inventory status
- Put-away (return to inventory)
- Updating inventory information

Lost Margin and Revenue

- Lost profitability from selling mis-delivered items at an unusually deep discount
- Lost sales downstream at company retail outlets, due to lack of product

Understanding the Basics of Voice

Unfamiliar with voice? Here are few basics about the technology.

Voice-directed workflow

Workers wear a headset with microphones and communicate verbally with software to receive and confirm tasks. For example, in the picking workflow, a worker is instructed to go to a pick location. The interaction between the worker and voice system would likely look something similar to the following:

- **Voice:** Go to location A21b.
- **User:** Confirm check code for A21b.
- **Voice:** Pick five cases of product 123.
- **User:** Confirm quantity, five.
- **Voice:** Go to location A35a.
- **User:** Confirm check code for A35a.
- **Voice:** Pick five cases of product ABC.
- **User:** Confirm quantity, five.
- **Voice:** Capture lot codes for product ABC.
- **User:** Lot 1, A1B2C3D4.

The majority of benefits for using voice-directed solutions come from the hands-free, eyes-up nature of voice technology. By using a headset instead of a screen or piece of paper, associates can keep their eyes continuously on the task at hand. By being free of holding a keyboard or scanner, or reaching for a piece of paper, both hands can be used to carry out a range of tasks.

Speaker-independent technology speeds adoption

Historically, voice technologies have been focused on what is referred to as *speaker-dependent solutions*. This is where a user trains the system to recognize their individual language, dialect and speech patterns. This allows the speaker-dependent solution to filter out environmental noise, increasing accurate and robust responses from the user's voice. The flawless performance of this capability is critical to the success of the system.

Over the last few years, additional options have been added to voice systems to help customers address the need to bring on temporary workers and not have to train them on a speaker-dependent solution. The newest "speaker-independent" solutions do not require a user to train the system to recognize his or her individual language, dialect or speech patterns; instead, the technology tries to match the user's voice to generic, previously created voice patterns.

Expected results with voice-enabled workflows

Results vary based on the workflows that have been voice-enabled and the current solution being replaced (paper, scanning, lights, etc.). Potential benefits include:

- Increased accuracy — more than 99.9%
- Increased productivity — 15–50% (or more)
- Decreased staff churn
- Efficient regulatory compliance
- Inventory optimization (reduced holding costs)
- Removes trips back to assignment desk
- Removes cost of printing and distributing picking documents
- Removes cost of re-keying order amendments, picking confirmations and catch weights
- Fewer administrative, fixed asset and consumable overheads
- Hands-free and eyes-free — makes picking easier
- Real-time feedback for proactive management
- Real-time stock updating
- Real-time visibility and integration into business system decision making
- Improved safety — hands-free and eyes-free
- Reduced training — verbal prompts are easier
- ROI in 2–24 months

WIDE APPLICABILITY OF VOICE THROUGHOUT THE DC

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Voice-directed solutions are most often associated with the picking workflow. However, voice solutions provide value to mobile employees over other user interface methodologies whenever hands-free operation proves advantageous, including:

Receiving – The accuracy of the receiving process is increased as the receiver focuses on one thing: receiving the product. The rate of receiving also increases, as the receiver is not interrupted with stop-and-start steps in the process.

Put-away – Can be automated to meet the specific needs of the warehouse management system (WMS) and match the demands of each environment. Using voice provides advantages and benefits, regardless of whether an operator is performing driver- or system-directed put-away.

Replenishment – Workers focus on the timely moves of pallets or cases being dispensed, as well as the location where the work is being done. Voice enables multi-tasking, so a worker can carry out the replenishment and confirm the activity, all at the same time. This results in better performance and real-time data collection while increasing task accuracy.

Cycle counting (inventory) – Whether it's integrated as part of the picking process in order to update low-quantity items, or as an ad-hoc or stand-alone application that helps maintain more accurate inventory levels, cycle counting is one application that has both hard and soft payback benefits. Inventory no longer requires bodies and days to get counts; now managers can access real-time updates every day to ensure their warehouse is moving at top speed.

Temporary moves – Moving product from a reserve location to a pick slot or from a storage location to a reserve location may be necessary to increase operational efficiency. Workers need to know where the product is moving from, how much needs to be moved, and to where it's being moved. This can be easily managed with voice and provide real-time updates to pickers without creating skips or mis-picks.

Packing – By voice-enabling specific instructions or priorities for packing, the process can be integrated directly into the selection and delivery steps in order to maximize worker efficiency and keep the orders moving from start to finish.

Staging/loading – Another peripheral application for voice that can help to increase worker efficiency in the warehouse is at the docks. Providing voice direction to lift drivers to stack and stage lanes as part of the inbound/outbound side of fulfillment can help minimize errors and stops and starts due to reading screens. Direct loading also can be managed by voice for operations desiring to skip staging.

Cross-docking – Moving products from the dock to the point of activity (e.g., piece putting) is critical to sustaining the flow of product through the warehouse and out to customers. Integral activities that are powered by voice can help keep up with the needs and schedules of the outbound processes while helping drive worker efficiency and productivity. As with put-away, cross-docking can help get the right products in place for the next step of the fulfillment process, better helping to utilize operators who can now do more in less time.

Returns – An integral part of many warehouses, managing returns can be labor-intensive and slow. With voice, quickly breaking down, assessing, and delivering returns to the right step of the process can help to quickly update critical system information and reduce the cost of handling returns to help margins on those products.

Value-added services – Quickly incorporate value-added services like tagging or labeling into your picking or fulfillment process to maximize efficiency and keep up with order velocity. Create more consistent processes, eliminate the stops and starts, and remove non-value-add touches.

Time and attendance – Help improve employee morale and eliminate time-consuming start and end-of-shift operations; voice-enable time and attendance as part of the voice experience and get faster, more accurate data in real time.

As DC and warehouse operations continue to strive to maintain consistent, peak performance — regardless of their size — it's critical to address productivity, accuracy and efficiency challenges with solutions that deliver required outcomes. Applying voice technology to a variety of operational workflows will help small- and mid-sized businesses succeed through flexible management of the growth associated with e-commerce and other order fulfillment challenges.



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AVTWP (US) | 03.20
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