Voice Beyond Selection

Extending the ROI Benefits of Voice Technology

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Overview

This white paper explores the reach of voice technology beyond its birthplace in selection and into all areas of the warehouse. From receiving to put-away, to replenishment and line loading, voice technology can provide the ability to streamline processes, improve operational performance, and rapidly deliver the most compelling ROI.

First, we'll review where voice originated in the warehouse and the benefits it delivers. Then, we'll explore how voice can impact other processes and what benefits can be recognized by this growing technology.

What is voice technology?

The idea of translating spoken word into data (and vice-versa) and the science of speech recognition has evolved over the past 20 years to the point where we use it in our everyday lives when we pick up a phone. Today, one phone call can connect you to a voice-directed menu where you can check on movie show times in a fraction of the time it would take to scan through page after page of a newspaper to find the same information. You can complete your weekly banking transactions on the phone, interacting with a voice-directed banking application, rather than having to make a special trip to a bank or an ATM. In much the same way, work that was once done via paper printout in a warehouse can now be done via voice. Rather than waiting for paper printouts, ruffling through pages, opening and refolding papers to complete your task, and hoping the ink doesn't rub off, workers can now listen as they are directed in their work assignments and reply when the work is completed.

The adoption rate of voice inside the warehouse has grown steadily year after year. As more and more companies are introduced to voice and see the benefits that can be realized using voice, the technology is being accepted more readily, and vendors are beginning to offer voice as a value-added solution to their warehouse

management solution (WMS) product suites. In fact, Vocollect has working relationships and integrations with many of today's leading WMS providers—and more partners are jumping on the bandwagon every month. By being able to leverage existing architecture of a WMS and the data stored inside these leading solutions, voice provides an ROI driver that allows companies to leverage their existing WMS investment and take warehouse operations to a whole new level of performance.

Vocollect's integrated solution

Vocollect's industry-leading industrial speech recognition technology and the built-for-purpose Talkman® mobile, wearable computer to the business process logic that drives your warehouse operations, the Vocollect integrated solution uses state-of-the-art technology to empower voice-directed distribution throughout the warehouse. The total system is made up of individual solutions, each of which drive the total ROI. Delivering a piece of the solution really only provides a part of the ROI. Vocollect recognizes this and has created a solution that is focused on providing the market's leading integrated solution.

The Vocollect Talkman terminal receives the same data used to drive paper-based or RF scanning-based operations directly from a host WMS or inventory management system and translates it to voice commands.

As work is completed, the workers respond, their words are translated back to data, and sent wirelessly to the host system in real-time. Vocollect's terminals and headsets are designed specifically to deliver accurate voice recognition without loss of data or reliability in rugged conditions, creating the right tools for the job in high-noise environments, sub-zero freezers, or any other warehouse conditions.

With voice, there is no manual entry, no equipment to juggle, no labels to carry, and no papers to misread. Because Talkman computers enable "hands-free, eyes-free™" operation, workers can move through their assignments faster and more efficiently. The results: increased speed and near-perfect accuracy—truly a powerful combination.

Key benefits of voice

As we've mentioned, clear benefits are driven by the hands-free, eyes-free nature of our solution. Because of this, accuracy and productivity are immediately improved. It's also easier to train employees, and there are fewer incidents from a safety perspective to both workers and products. Where do these benefits come from? Let's take a look:

Accuracy:
Because the worker is able to move about without having to stop and read a document, or look down at a small screen, or enter data, or pick-up and re-holster a scanner, the worker's focus is always on the task at hand. As a worker approaches a pick slot, he or she hears the location and can look for it at the same time. A worker confirms the location (via a check-digit) as they are picking product. The opportunity to look away and forget, or misread a location/product is minimized; therefore, accuracy is increased.

Productivity:
As a worker completes an assignment or moves through the warehouse, the worker is able to focus on what he or she's doing, whether it's walking to a new pick location, arcing a fork truck to get a pallet, or counting inventory slots. There are no intermediate needs to turn his or her attention away, stop to read, or get off his or her fork truck to confirm a pallet. As such, all his or her interactions with the Talkman terminal are internal to the motions of his or her activity, saving precious time.

Training:
Because the entire process is driven by voice, there is no need to train workers on reading printouts, knowing when/where to apply labels, or confirming information through a keyboard. Once a worker attends training and creates his or her voice templates (which takes about 15 minutes), the entire work process is driven step-by-step through voice commands. Workers are typically up and running in about 50% less time than other methods, because they have one tool to use, versus paper for one task and scanning for another.

Safety:
Because focus is never removed from the task at hand, instances of product damage or worker injuries are greatly reduced. A worker has no need to take his or her eyes off the box cutter or off the racking as he or she places a pallet in a tight spot. As a result, there are fewer injuries, fewer dropped products, and fewer punctured pallets, providing direct savings to the bottom line.

The Value in Voice-Directed Selection

With voice-directed selection, workers can move through their daily task-load without being constrained or slowed down by bulky hand-held equipment or cumbersome paper lists. They are also able to complete their daily workload more accurately and efficiently. With the Vocollect solution, workers are given their assignments and efficiently directed to each line item on their work orders. They are told the correct quantity to pick and then directed to the next item. All this is controlled with our configurable selection workflow, which is designed to mirror the unique operations used in warehouses. The Vocollect solution provides numerous process flows to facilitate your entire selection process, including: piece picking, case picking, catch-weights, and batch picking. Whether picking slow-moving products or high-volume products, voice delivers the speed and flexibility needed to help fulfill all of your customers' orders.

Voice beyond Selection

There are many other processes inside the warehouse that can be accomplished more efficiently with the implementation of voice technology, providing even more opportunities to build on the ROI delivered from the Vocollect integrated solution. This section outlines the core processes associated with some of these operations and provides insight into how voice can be leveraged to create more efficient processes by allowing the process and the technology to complement one another.

Receiving

Receiving is the process by which incoming goods are "checked in" at the warehouse receiving dock or door. Usually, validating the order received requires checking the purchase order. Most receiving operations are either paper-based or RF scanning-based. The typical receiving procedure is as follows:

1. A truck filled with pallets of product arrives at the dock door, and the truck driver hands a bill of lading (BOL) to the receiving office clerk. The BOL usually contains the purchase order (PO) number.
2. The clerk performs a one-to-one comparison of what is reported on the BOL and the quantities of the items on the PO. If, for example, 50 of item A were ordered, but only 40 are noted on the BOL, the clerk makes the necessary adjustment into the WMS or order entry system, keying in the information via a keyboard.
3. A "receiver" on the warehouse floor then checks the items as they come off of the truck, again verifying quantities of the items against quantities listed on the BOL.

The main validation point in this process is verifying that a particular product on the pallet being received is actually on the PO. This is usually scanned or entered in through a keyboard, and that data is then communicated to a back-office system. When the first pallet is pulled off the truck, the receiver acknowledges, via paper or RF scanner, that it's product X with a quantity of Y on that pallet. The last step is to typically put a label (often a smart label) on the pallet.

If, for example, the truck has brought 40 of one item, and each pallet holds 25, the warehouse must now create one pallet of 25 and one pallet of 15. Therefore, it's critical to make sure that the right label is on the right

pallet. Often, a warehouse will receive the correct quantity of product, but the pallets are labeled incorrectly. If a pallet is mislabeled, there are downstream implications because the WMS is misinformed about how much quantity or what product is on a particular pallet. This can result in an order that cannot be successfully picked for a customer, or even worse, the wrong product could be replenished to a slot.

There are steps associated with receiving where a voice-directed process would be more beneficial and productive. For example:

Receiving in a paper-based environment:
When a receiver is tracking against a hard copy PO and trying to apply labels to pallets, he or she writes down how many items are actually received on a pallet. This is usually done via a clipboard and requires the receiver to constantly put down and pick up the clipboard while trying to confirm quantities and apply labels. Because a receiver is juggling multiple tasks, it is more likely that a receiver may receive something that he or she assumes is the right product, but it's the wrong product. A pallet may contain 10 cartons of product A, but it may be 10 cartons of the wrong product version or 10 cartons of product that was supposed to be received on another date. If the receiver is distracted by trying to handle paper while receiving the product, he may not notice these details. So, when the receiver takes the paper back to clerk, the clerk incorrectly updates the PO and closes an order that should not have been closed.

Receiving in an RF environment:
Using RF, a lot of the steps required in paper-based/keyboard-based receiving processes are eliminated. Receivers can receive goods or change the quantity being received while they are on the floor, and the receiving data is automatically fed into the

system. If it's the wrong item or wrong quantity, this will be identified when the receiver scans the electronic product code (ePC), which identifies the product, or the barcode, which identifies the quantity. But even though RF provides these added benefits, voice can streamline this process even more.

Receiving with voice:
With the application of voice in the receiving process, receivers can work "hands-free, eyes-free™", confirming the correct PO by speaking the number, confirming the pallet by reading the LPN number that is applied to that pallet or pallets, confirming quantity by saying it, and updating the PO by verbally confirming that all the delivered product has been received. All of this can be done while a receiver easily maneuvers around the pallet to inspect the boxes and stack product onto new pallets for put away. The accuracy of the receiving process is increased because the receiver can focus on one thing: receiving the product. The rate of receiving also increases because the receiver is not interrupted with stop-and-start steps in the process.

Put-Away

There are two common methods of put-away inside the warehouse: driver-directed and system-directed. With the Vocollect solution, both methods are available and can be implemented to meet the specific needs of the customer. Using voice provides advantages and benefits, regardless of whether an operator is performing driver- or system-directed put away.

Driver-directed put-away:
This process allows the forklift driver to determine where product will be put-away. This type of put-away is usually performed in environments where there is not a WMS or inventory management system, and product availability is known by the workers on the warehouse floor. Driver-directed put-away

used to be the preferred method; however, in recent years, most facilities have moved towards an automated process of utilizing their WMS or inventory management system to choose the ideal put-away location. In driver-directed put-away, the received pallet will typically have a label (sometimes referred to as a smart label) that reflects the general information about the product on that pallet, such as the receipt date, product description, PO number, ti-hi information, and the pick location. The forklift driver identifies the pick location from the label and is generally instructed to find a put-away location in relative proximity to that pick location.

The benefits of driver-directed put-away are limited to the fact that it requires no investment in a WMS or inventory management system. It also provides the forklift drivers with the independence to leverage their knowledge of the warehouse and move items where they feel they'll be best positioned. The downside to driver-directed put-away is that there is no way to monitor the accuracy of the forklift driver. When problems are found—like missing pallets or invalid quantities—it's difficult to know how the problem originated. It's also difficult to know how many pallets the drivers handled throughout the shift. As a result, inventory storage efficiency, inventory accuracy, and forklift productivity are difficult to track.

One other problem is in forklift drivers putting the pallet in the first available location they come across. This may increase the amount of pallets one can move throughout the day, but it tends to scatter the inventory throughout the building. This makes it more difficult to find the product when replenishments are needed, which can increase the number of shorts throughout the day. It also tends to increase travel time during the replenishment process

and create uncertainty of inventory balances.

Driver-directed put-away with voice:
Voice enables a warehouse to use driver-directed put-away without these drawbacks. Using a voice-directed solution, forklift drivers report where each pallet is put away. The driver identifies the pallet being put away by speaking a pallet ID. The ID is then reported to the host system. When the driver puts away the pallet, the driver says where the pallet is being put. The put-away location is sent to the host system, where it is validated and stored. Date and time stamps are used throughout the put-away process to track productivity and possibly track problems.

With the data provided by voice-directed put-away, accuracy can be monitored, the source of put-away problems can be found, inventory can be tracked, pallet misplacements can be identified, and inventory storage can be accomplished more efficiently.

System-directed put-away:
This process takes the decision-making off the floor and allows the WMS or inventory management system to determine the best location for each pallet to be stored. This is typically done via a RF fork-mounted terminal or by a pallet label generated prior to the receiving process. The put-away location is determined by using predefined algorithms in the WMS that calculate the best location for that pallet based on cube fit, proximity to pick location, and distance from floor.

The system-directed method is typically done one of two ways:
- The first uses smart labels, which show the destination location in bold numbers so that the location can be easily read by the forklift driver. These labels are

generated prior to the physical receiving process and then affixed to the pallet during the receiving process.

- The second uses RF fork-mounted terminals. The driver interacts with the terminal via scanning and data entry to confirm the correct pallet, as well as verify the put-away location. The RF environment allows for real-time visibility and decision-making whereas the smart labels are predetermined before the receiving process begins. If a mistake is found in the label environment, it will most likely not be identified in time, and product may be put away in the wrong location.

System-directed put-away with voice:
With voice driving the system-directed put-away process, the driver speaks a pallet ID, which is then sent to the WMS. A return message is sent back to the worker reflecting the preferred location to store that pallet. Once the pallet is validated and the destination location is received, the driver is directed to an exact location. The driver speaks the location check digit, which is used to confirm that the driver is at the correct location. Once the put-away location is confirmed, the driver can proceed to put away the next pallet. Date and time stamps are used throughout the put-away process to track productivity and possibly track problems.

Many of the benefits of using voice in system-directed put-away are the same as that for driver-directed put-away. Using voice allows for absolute accountability and tracking of the put-away staff and process. Our solution provides the ability to track productivity as well as accuracy. Another benefit of using voice is that by enabling drivers to report put-away information with hands and eyes free, forklift drivers can focus on maneuvering the fork truck. This increases productivity in addition to safety

and reduces equipment and product damage.

Transfers

Moving pallet A from location 1 to location 2 is the basic process of transfers, a typical inventory control function. A transfer assignment may involve moving product from a reserve location to a pick slot or from a storage location to a reserve location. The workers need to know where the product is moving from, how much needs to be moved, and where it's being moved to. The locations are not specifically designed for any particular product. Much like driver-directed put-away, the driver may decide to temporarily move an item to a floor location while work is being done in it's original location.

Transfers with voice:
The value of using voice in this process is very similar to other fork truck activities. The worker's focus is on the task at hand, which is important because workers are typically maneuvering the fork truck and the pallet around rapidly. Workers are able to interact with the WMS via voice to provide updates, in real-time, as to what product they're moving and where they're putting it in the warehouse. This allows seamless flow of the entire fulfillment process so that workers performing other activities like replenishment or selection can be directed to the correct location to find product. Both productivity and accuracy gains are driven by the use of voice in this process.

Line Loading

Line loading applies to scenarios where an automated conveyor system is used. In these situations, cases or totes, or a combination of both, are delivered to an outbound shipping dock via an automated conveyor belt. Line loaders then have to retrieve the tote or box and place it onto a customer pallet or a truck. Possible points of

failure include picking up the wrong product, picking up the wrong quantity, or putting product onto the wrong pallet.

Line loading with voice:

With voice, line loaders verbally report which cartons (identified by a carton ID) are being placed on which pallets (identified by a pallet ID), providing real-time validation that the right case or carton is being loaded onto the right pallet. As with other processes, date and time stamps are used throughout the line loading process, providing data for productivity tracking. Managers can use this data to calculate the number of hours spent line loading versus the number of cases handled. Another benefit of utilizing voice in line loading is the ability to track shipment accuracy. If a store reports that they did not receive a certain product, the warehouse manager has instant visibility as to which products were delivered to the customer and the quantity delivered. No more granting credit or eating unnecessary costs—now the exact product and amount is updated in real-time throughout the line loading process.

Replenishment

Replenishment is the process of replenishing location, which is usually a pick slot—workers going to location A, grab a pallet or a number of cases, and take them to the location that needs to be replenished. As with put-away, replenishments are generally managed in one of two ways: paper-based replenishment or replenishment using RF fork-mounted terminals.

Paper-based replenishment:

These replenishments are created during a wave or allocation process. Clerks monitor the selection orders, determine which orders are being worked, and hand out the paper-based replenishment assignments to replenishment workers. It's a manual process and very difficult to manage because replenishment workers have to stay just ahead of the order selectors so that they are replenishing at the right time. Accuracy is also difficult to maintain because there is no effective way to validate the pallet or location accuracy in real-time.

Replenishment with RF fork-mounted terminals:

With RF fork mount terminals, replenishments are systematically triggered as a result of selectors signing onto their terminals. These replenishments are still predetermined and created during the allocation process, just like on paper, but the reprioritization takes place in real-time based on the selector signing onto their terminal at a certain time. This allows for better timing between the selection and replenishment process and prevents overstock or shortages.

The problems that arise in both the paper-based and RF terminal-based replenishment processes include loss of focus and loss in productivity. The right information has to be read and checked against the storage locations to ensure that the right product is being replenished. With multi-tier locations, the locations are difficult to read. Regardless of whether the locations are listed in sequence at eye-level or on each tier, it takes concentration to read the location and then maneuver into a position to replenish the slot. Often, the numbers can be misread, or the operator must stop and reconfirm the location.

When the forklift driver is performing replenishments with a fork-mounted RF unit, he or she can use barcodes or a check digit to confirm the location. Some companies barcode their location label, while others use check digits that must be keyed in. Scanning a barcode or keying in a check digit takes the focus of the driver away from what he should be doing, which increases the chance for error and decreases productivity.

With paper, accuracy and productivity are even more difficult to achieve due to lack of real-time tracking and validation capabilities.

Replenishment with voice:

Again, the benefits of using voice for replenishment are much the same as those for using voice for other warehouse processes. The driver's continued focus is on the pallet he or she's moving and the location he or she's going to place the pallet. The Vocollect solution enables multi-tasking so the driver can maneuver his forklift, raise the forks, and speak the check-digit, all at the same time. This results in better performance while still maintaining absolute accuracy.

Voice also reduces equipment and product damage. By keeping the forklift driver focused on what he or she's doing and keeping his or her line of sight on the right things, there is less of a chance that he or she can damage the product or the equipment. Customers using voice-directed applications in warehouse processes have realized a decrease in safety issues by more than 50%.

Flow Through

Flow-through, in the warehouse, is designed to minimize inventory stock and labor. When product is received, it is already allocated and predestined for end-customers. In the typical flow-through process, product is received much like in normal receiving, but the last step of the process varies somewhat since the product is allocated for direct shipping to outbound customers. In the receiving process, a label with a pallet ID is attached to the pallet. Once the pallet ID is assigned, a worker can then pick up the pallet, acknowledge the pallet ID to the system, and move product from the pallet to predefined store locations, typically located near the shipping dock. This is often referred to as reverse picking or put activity, because the worker starts with a full pallet of product

and disperses it to various locations until he or she ends up with an empty pallet.

Flow-through with voice:

The benefits of using voice in this process are similar to other applications, including the ability to direct the effort of the employee via a WMS or inventory management solution. Leveraging the knowledge and inherent algorithms of the WMS, the terminal is able to direct the employee to breakdown the received pallet into its appropriate allocated customer locations. All activities are date and time stamped to validate the process and provide data for back-tracking or verification. The use of check digits is employed to drive the accuracy of the process and provide real-time system updates. And as with other processes, the "hands-free, eyes-free™" operation with voice helps to prevent loss or damage and increases the worker's productivity.

Conclusion

Whether you're looking at new ways to expand the existing use of voice technology in your warehouse, or you're evaluating voice for the first time, looking beyond selection is a valuable way to extend the powerful ROI that is delivered by using voice technology. Voice has proven its benefit and helped countless companies increase their order accuracy, improve their operations' effectiveness, and maximize their employee productivity. All of these savings can be calculated to the bottom-line.

With the availability of more applications using voice, companies can realize more incremental gains in ROI and quicker payback. Fluidity across the warehouse is just one of the intangible benefits of utilizing voice technology in more and more applications. Being able to track accurate inventory location and levels at any point in time fully drives velocity and efficiency in your fulfillment process and aligns your operations with your customer demand, without sacrificing service levels. Voice has proven its value and over-delivered in its results. It's ready for you—are you ready for the payback?