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Using Voice-Directed Work in the Supply Chain

What IT Executives Need to Know

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A Vocollect White Paper



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Executive Overview

The questions in the minds of today's information technology (IT) executives run in an endlessly agonizing loop:

- Do I have the right infrastructure in place?
- Are my servers and databases and applications doing what they need to do?
- How do I separate valuable new technology from all the junk?
- Is my system secure?

These are tough questions that can ensure sleepless nights. But as any business-minded IT practitioner knows, these concerns are not about technology on its own. They are about technology as it relates to the bottom line, corporate strategy and the myriad of threats that include rising costs, increased competition and ever-slim profit margins. In short, what really keeps the strategic IT executive awake at night is this question: How can I use technology to boost productivity, make the supply chain more efficient, and maximize ROI? Many are finding the answer to be voice-enabling their warehouse.

The market momentum for voice occurring is due to the immediate value provided by the technology and the pragmatic nature companies are able get started to rapidly and show quantitative business results within days. Hundreds of thousands end-users use Vocollect products each and every day with great success. The promise of hands-free, eyes-free task execution continues to drive a multitude of key warehouse processes and has become an important ingredient in a thought leading company's IT strategy.

The wonders of the voice-enabled warehouse are causing many companies to reassess their processes and procedures in order to leverage the capabilities inherent from voice-enabling their warehouse. In fact, many are calling the voice-enabled warehouse, the next generation in distribution center and warehouse material-handling management. A fundamental shift is underway as many thought leaders are reviewing their existing warehouse processes. There has been a continuum of change over the years of evolving distribution processes that have moved from being paper-centric to RF-centric (think barcode scanning) and now many of these same processes are evolving to become voice-centric. For some, voice has become the starting point for re-engineering warehouse processes and systems, rather than an after-thought.

A Short History of Voice

Voice recognition and speech technology began deep inside the workshops of Bell Laboratories during WWII, where researchers believed in a radical new idea: that one day, machines would be able to recognize and respond to human voice commands.

Gradually, other researchers outside of Bell Labs caught wind of the idea and they, too, shared the excitement about the advances possible if computers could talk and be spoken to. These researchers toiled away silently for years. Then, in the late 1980s, voice recognition and speech technology began to grow into their potential.


Today it's hard to find a major industry that hasn't embraced voice in some fashion. Automobile manufacturers use voice in vehicle navigation and safety systems to guide motorists to their destinations. Banks use voice to help consumers complete transactions over the phone. And a host of other users, including airlines and weather bureaus, used automated voice systems to disseminate information. As voice in business continues to proliferate, consumers are becoming increasingly accepting of it in their daily lives.

Voice and the World of Work

In the last two decades, voice-directed work has made significant inroads into the global supply chain. Here, the ability to be voice-directed is literally freeing up workers and allowing them to be safer, more accurate and more productive on the job. Voice-directed work takes the most human approach to communication – two-way dialogue – and literally talks people through their daily tasks.

For the supply chain/distribution industry in particular, voice alleviates the strenuous multi-tasking that is typical of work in the distribution center (DC). Voice-directed distribution's immediate contribution to more efficient receiving, selection, replenishment, put-away, cycle-counting, and other areas led many of the major grocery distributors to be early adopters - today, 72% of the top 75 grocers in the U.S. are Vocollect Voice customers.

While DC managers in the grocery and food industries were among the first to embrace voice, word of productivity and accuracy gains through voice quickly spread. As a result, today many voice-directed work users are household names from a broad range of industries, including Office Depot, Pep Boys and Pepsi Bottling Group in North America;



and Norauto, Easydis and Primafröst in Europe. The ease of use and success of voice-directed work has quickly found adherents in retail, third-party logistics, manufacturing and healthcare companies as well. Voice has proven a significant way to help organizations maintain “lean” operations, decrease their training costs, and sharply reduce the time it takes for workers to become functional in their role – especially useful for companies that employ seasonal help or that have challenges with staff turnover.

How Voice Works

During the course of a typical day in a DC, work files are created by the company’s warehouse management system (WMS). In companies without voice, work assignments generated by the WMS are transferred to paper-based systems, RF scanner-based systems or pick-to-light systems. These systems are labor-intensive, time-consuming, and error-prone – and not all of them can scale as the business grows. But in a voice-enabled DC, the process is much simpler and more accurate. Here’s how it works:

1. Employee assignments such as put-away, order selection and replenishment tasks are generated by the company’s WMS.
2. These assignments are sent via a radio frequency network from the WMS to a lightweight, battery-powered, mobile computer worn by the DC associate.
3. Once received by the wearable computer, the work assignments are converted into a series of discrete verbal commands which the worker hears through a lightweight headset. The instructions direct the employee to an aisle/section and slot location.
4. Once there, the employee confirms he or she is at the proper location and completes the task by speaking into his or her headset.
5. The employee’s voice is recognized by the voice recognition software running on the wearable computer, which translates the spoken response into data and sends that data back to the WMS.
6. The WMS issues the next appropriate command and the process repeats itself.

What is the Bottom Line?

By replacing labor-intensive, error-prone systems with more efficient voice-directed work, companies experience:

- **Increased productivity:** Voice increases productivity by making workers more efficient. In DCs utilizing paper labels, hand-held scanning devices and systems requiring the employee to deactivate a lighting mechanism, their attention is frequently being diverted and productivity lessened. Because voice is a hands-free/eyes-free operation, workers can devote total attention to the task at hand, therefore greatly reducing unproductive time and mistakes. In addition, since they are conversing actively with the system, superfluous side conversations are virtually eliminated.
- **Depending on the unique DC environment, typical productivity gains range from 11 to 50 percent or more.** These gains can quickly translate into hundreds of thousands of dollars in annual savings. Language barriers, turnover, seasonal fluctuations and the cost of training are a few labor-related issues that often compromise labor productivity. Because voice accommodates different languages and training time takes just a few hours, companies save significantly on labor costs.
- **Improved accuracy:** Voice enforces order accuracy through the use of random check digits. The check digits are placed directly at the product's location and must be read when the worker is at that location. Because the voice system won't allow the worker to continue unless he or she reads the appropriate digits, accuracy is guaranteed nearly 100 percent of the time.
- **Improved worker safety:** Because the employees' hands are free and their eyes are not distracted by having to hold the RF scanner in their hand or to look at a piece of paper, they can focus on the critical activities going on around them. Since the employees' heads are up, they are much more aware of potential safety issues.
- **Lower turnover:** Voice allows workers to perform at higher levels with reduced effort. This means they take more pride and ownership in their work. A longer-tenured DC workforce reduces the cost and time waste of turnover and excessive new-hire training.

Real Results

At Smith Drug Company, a wholesale pharmaceutical distributor based in Spartanburg, S.C., the 2005 installation of Vocollect Voice, Vocollect's system of hardware, software and voice dialogs, generated an immediate 20 percent jump in productivity, and the accuracy rate for deliveries soared to 99.99 percent. According to Randy McConnell, director of information systems, the productivity increase has remained at 20 percent for over two years.

In deploying voice, "I asked for a 20 percent increase in productivity with an accuracy rate of 99.99 percent, and that was easily attainable. Now we are averaging about 80,000 units a day from our DCs. I got my return on investment in just six months," McConnell says. "We've not only saved quite a bit of money," but our customers are much happier, because they are not getting wrong deliveries. This is helping us get more business, as well as keep the customers we have."

Other benefits Smith Drug Company has attained through voice include improved on-time deliveries that eliminated the need for overtime and the reduction of training time from two weeks to three days.

The Pep Boys – Manny, Moe & Jack is America's leading automotive aftermarket retail and service chain, with 593 stores in 36 states and Puerto Rico. It delivers more than 75 million items a year to its 593 stores through 1.8 million square feet of DC space in five DCs. Before using voice, Pep Boys used a variety of order selection methods.

In an attempt to increase efficiency and accuracy, Pep Boys deployed RF scanning guns to scan the barcode of an item and assemble an order. But the guns required workers to input item quantities using keystrokes. Another disadvantage was that a worker had to put his or her RF gun down to pick up an item. Not only were costly guns lost this way; it also interrupted workflow.

Within just six months of deploying voice into all five DCs, Pep Boys documented increases in worker productivity, with voice outperforming RF scanning by 16 percent and 21 percent over paper. Accuracy improved by .5 percent, which also led to reduced return costs. In paper pick sections where the company had the greatest opportunity for improvement, its accuracy rose from 98.68 percent to 99.46 percent, a 58 percent gain. These performance gains alone are expected to save the company over \$3 million annually. In addition, training time was reduced by at least 50 percent, which provided the company with more flexible labor reallocation.

Typical IT Questions

When IT executives begin to investigate voice, there are, naturally, a number of questions. Here are answers to some of the most common concerns:

Infrastructure

- Is voice going to be difficult to implement? The resounding answer is no. Voice-directed work has a tremendous impact on the efficiency of the supply chain and is quite easy to install. It's important to work with a supplier that has a strong track record indicating an intimate knowledge of job functions, operating environments, and business realities.
- Is the technology mature enough? Voice-directed work has been successfully deployed by both large and small companies for well over 20 years. The leading voice-directed work supplier, Vocollect, has hundreds of thousands of users in 500 installations in over 30 countries across six continents.
- How do you integrate the WMS with the voice system? A voice deployment requires special software to enable receiving work assignments from the company's WMS and the two-way dialogue required to give assignments and confirm that tasks are completed. The voice supplier brings to the table experience across multiple businesses and the most effectively engineered combination of hardware and software designed to make using voice as natural and easy as possible.
- Most major WMS providers already have the necessary interfaces for voice in place. The best voice systems have been designed to integrate directly without middleware to many of the most popular commercial WMS systems. A direct interface can even be implemented for home-grown legacy WMS systems to provide true real-time updates for each activity on the DC floor. In addition, voice suppliers offer specially designed middleware solutions.
- What security standards are supported by voice? The best voice suppliers support all standards, including Wi-Fi, WPA-PSK, and WPA-Enterprise.
- What device management tools are necessary? Since efficient voice systems must manage voice-related configuration information beyond the capabilities of common mobile device management software, full-featured voice systems have device management functionality built in as an integral part of the system.

- Is installing voice similar to implementing a WMS or ERP? Not even close! Voice-directed work can literally be installed in a day and employee training takes just a few hours.

IT Engagement

- What kind of involvement is required from the IT organization? Once the technical interfaces are completed, there will be minimal requirements from the IT group as part of the overall project team. Experienced suppliers know how to take the lead on designing, developing, testing, project managing and implementing voice systems. Furthermore, once it's up and running, there is little overhead associated with ongoing support needs.
- What does the IT infrastructure framework look like?
- Voice-directed systems interface with a company's existing infrastructure, either via a direct communications interface to the WMS, or via middleware. Relevant information is translated into work assignments that are distributed as voice instructions to a body-worn voice device running on the company's existing 802.11b wireless LAN. Integration is straightforward and IT infrastructure impact is minimal.
- Can voice be applied in both centralized and distributed IT environments? Yes. As wide-area networks become faster, more and more companies are looking at centralized systems where only the voice terminal and headsets are in use in the DC and the WMS is centrally located. Experienced voice providers can accommodate this scenario as well as create systems for use in distributed environments.

The Implementation

- What does the overall implementation process look like? Naturally, the installation process will vary greatly depending on the voice supplier selected. You'll want to look for a company whose implementation process has been finely-tuned, based on hundreds of successful installations. Ideally, a voice supplier should work with you to accomplish the following steps to ensure a successful installation.

Case Study - The Voice of Success

Burris Logistics, based in Milford, Del., is one of the largest cold storage third-party logistics distribution operations in the nation. Like other distributors, the company continually faces bottom-line challenges, including increased labor costs, higher fuel and electricity bills, and continual pressure from shareholders for greater returns. Not only that, but its customers expect Burris to deliver outstanding service day in and day out – without any cost increases.

Because the major costs had already been squeezed out of its supply chain, and because the company was already operating at a 99.6 percent accuracy rate, Ed Krupka, CIO, was faced with the daunting challenge of finding ways to use technology to gain incremental increases in production. “If we could boost productivity by even a single percentage point each day,” Krupka explains, “that would result in huge gains for our clients and shareholders.”

After studying voice options, Krupka decided in 2004 to implement Vocollect Voice in a pilot project. In one plant location, he targeted deployment within six weeks, but was up and running in just four. Because of the Vocollect open architecture, the group was able to develop a direct interface to the Burris WMS solution that would enable a real-time flow of information between the two applications. The integration of Burris’ WMS and Vocollect’s voice-directed work was literally completed over the course of one weekend.

The company’s IT team also utilized the configurable functionality of the Vocollect distribution application to quickly enable key parameters that met their process specifications. For example, Burris opted to employ both location and quantity verification in its process flow – requiring order selectors to speak both the location and quantity picked, in order to ensure accuracy.

Within the first full week of implementation, voice exceeded its target for order accuracy, delivering an impressive 99.88 percent accuracy rate – the equivalent of 9,000 fewer selection errors each year. The pilot was so successful that the implementation was immediately rolled out company-wide. Today accuracy rates remain at 99.88 percent, productivity is up 11.9 percent, and the cost of paper labels has been eliminated. Vocollect Voice was so effective that Burris recouped its investment cost in a scant 10 months.



Voice-Directed Work Makes Sense

With its two-decade, proven track record of achieving productivity, performance and high-yield ROI, voice can no longer be viewed as a risky corporate investment.

Senior IT executives making large-scale technology purchases for their companies can rely on the professionalism of their DC/supply chain leaders to implement voice-directed work successfully. By partnering with an established voice supplier with a proven track record of financial stability, integrity, and support services, DC/supply chain leadership can help voice-directed work soon become one of the most important strategic weapons in a company's global supply chain.

Improved Accuracy. Increased Productivity. Real Business Results.

In the complex supply chain industry, accuracy and productivity are of paramount importance. The proven track record of voice in driving quantifiable performance improvements has made it a natural fit for process reengineering efforts to solve key business challenges. Vocollect, a business unit of Intermec, is the number one provider of end-to-end voice solutions for mobile workers worldwide, helping customers achieve a higher level of business performance. Together with our partners, we enable nearly 500,000 workers at almost 2,000 companies around the globe to distribute US\$4.5 billion in goods every day. Contact us today to learn how we can help you transform your operational and workforce performance.

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