Speaker Independent Voice

The Right Tool for Warehouse Control Efficiency in Omni-Channel E-commerce Order Fulfillment

Introduction

It's abundantly clear that growth of online retail is impacting every company, regardless of size and industry. Virtually every company requires an e-commerce order fulfillment strategy within their distribution operation. Many operations are struggling to blend split case, low SKU count orders into a more traditional predominately full case, full pallet LTL order profile operation; leading managers to develop costly manual work around processes. Integrating e-commerce order fulfillment in existing DCs require an efficient, low touch process to contain costs and ensure accuracy.

Adding e-commerce to the existing DC operation can be complex to manage. Without the right processes, automation, and software, the DC will struggle to pick, pack, and ship low SKU count mixed carrier parcel shipments.

A highly efficient pick, pack, and ship process design directed with the right technology can ensure lower labor costs and higher accuracy order fulfillment. This article highlights the advantages speaker independent voice-directed picking provides to support the DC order mix of each SKU picks, case and pallet picking, as well as the additional demands e-commerce orders add to an operation's complexity.

Integrating E-Commerce into the Traditional Order Fulfillment Operation

Speed and accuracy are critical components of profitable order fulfillment operations. From the moment orders are received to when they are picked, packed, and shipped, the processes must be lean, low cost per order, accurate, scalable, and adaptable to change. This is especially true for e-commerce orders, which require order fill windows measured in a few hours to satisfy the customer service experience that will yield loyalty and gain repeat orders. E-commerce orders have a profoundly different order profile than full pallet and full case LTL direct to retailer and B2B operations. E-commerce orders consist of single items or a few individual items, for example, three pairs of shoes to try on - keep one, and return two. The returns processing also needs to be factored into the operation's design!

The goal should be to use existing DC facilities to integrate the e-commerce sales channel efficiently and profitably into the order fulfillment operation.

This order mix is vastly different than full trailer, or LTL mixed case pallet shipments delivered to a retailer's distribution centers. E-commerce order SKU counts continue to trend lower, with 60% of orders being one to three lines, and 15% or more of the orders being single SKU shipments. This trend toward smaller orders shows no signs of slowing down. Internet sales are projected to grow by 17 percent annually according to the U.S. Department of Commerce. Forrester Research reports that by 2017, e-commerce shipments will account for 10% of U.S. retail sales.

Consequently, retailers and retail suppliers are grappling with the pivotal question – how to adapt current facilities and/or design new operations to support omni-channel fulfillment, and cost-effectively handle the exponential growth of online orders?

Increasingly, suppliers to retailers are required to add in-house e-commerce to their operations. This capability is needed to support direct to consumer, retail clients, and Amazon direct to customer shipment demand. This demand requires additional pick, pack, and ship rules, and the ability for distributors to provide retailer specific compliance labels, packing documentation, and return labels to each shipment.
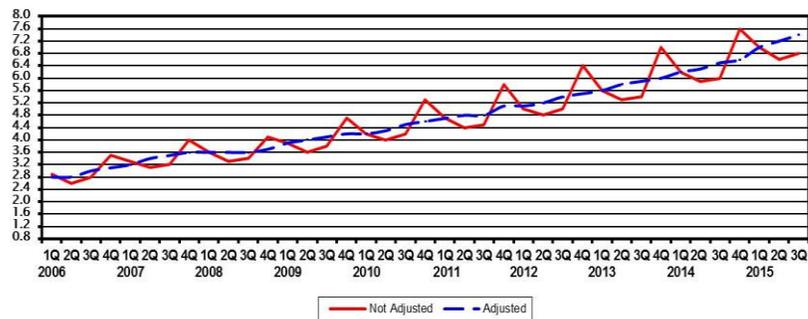
Estimated U.S. Retail E-Commerce as a Percent of Total Quarterly Retail Sales
Courtesy of U. S. Census Bureau

An example of this is fulfilling orders that appear to the end customer as if the shipment originated directly from Amazon or a specific retailer. Essentially, the DC acts as a 3PL; fulfilling e-commerce orders for Amazon and their retail customers. The order picking, packing, documentation, and labeling all need to match each retailer's specifications, with the potential of fines for errors if the shipment contains the wrong labels, missing labels, or missed delivery windows!

E-commerce by its very nature is a difficult distribution channel to manage, and not well suited to manual paper-based or RF-managed pick and pack process that relies on human decisions for enforcing shipment rules. The justification for superior technology, such as voice, is that it is ideally suited to direct pick and pack rules, proven to reduce costs, improve accuracy, track order details and worker productivity.

Benefits of Voice-Directed Picking Technology

Picking can be the most labor-intensive activity in omni-channel e-commerce order fulfillment operations, especially piece picking operations. Orders requiring rules like a specific package, color, accessory, promotional item, document, or gift wrapping benefit the most from voice technology because it directs and instructs operators on the required shipment and packing rules.

Voice is highly flexible and can change the instructions for the same SKU pick based on a customer, retailer/e-tailer's specific shipment rule. Voice automatically prompts the picker in a step by step manner with the work rules and integrates a paperless voice instruction step-by-step work process to validate picking. Voice picking outperforms paper, RF terminals, message displays, and many times pick-to-light, especially when accounting for the benefit of its increased accuracy!

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Latest Generation, Lean, Speaker-Independent Voice-Directed Picking

The latest generation multi-modal voice technology combines a very lean voice command set with integrated **hands-free scanning for single touch pick and pack verification.** Integrated scan validation, especially the use of the latest 2-D hands free scanners, significantly increases the speed, flexibility, and accuracy well and beyond traditional speaker dependent voice picking technologies. The latest advancements in speaker-independent voice recognition technology further drive increased productivity and ease of use. The voice engine has close to 100% recognition rates across multiple languages, while operating in noisy industrial operations. Secondly, **zero voice training** greatly reduces a worker's training time to minutes, making it possible to use temporary workers for picking applications.

The latest speaker independent voice engines have close to 100% recognition rates, while operating in noisy industrial operations, and require zero voice training to operate.

Speaker-independent natural language voice commands and responses are not only suitable for picking, but support all DC activities such as put to order, replenishment, cycle counting, pallet building, case sorting, and inspection tasks. Voice directs the worker to the location in the most efficient travel path, and directs the operator to perform SKU barcode scanning using a back-of-hand or ring-mounted barcode scanner. It directs and validates each step using a combination of voice commands/responses and hands-free two-dimensional (2D) barcode scanning. 2-D scanning is omni-directional scanning to speed-up by 5% the location, SKU, lot and serial ID barcode capture, and validation steps.

Keeping worker's hands free and their eyes focused makes an operation safer while allowing operators to hear, see, and verify SKU, quantity, lot, and serial number capture in a fast, accurate, single touch operation. **Picking performed with scan validation, vision, and speech is a three-step verification**. Multi-verification voice **consistently achieves a 99.98% to 99.99% accuracy rate** – far higher than voice only technology.

Quite different than first generation voice systems, speaker-independent voice *algorithms have continued to advance* and now automatically recognize voice responses regardless of an individual's accent. The system uses a small client message architecture that resides on the small light weight voice-enabled PDA that can operate for 14 hours or more between battery charges.

The Voice Server sends and receives message packets (approximately 25 bytes per message), to transmit the natural voice instructions and receive worker voice and scanning confirmation messages. This uses minimal network bandwidth, and is a fraction of the size of network bandwidth usage compared to many voice picking technologies. The voice server application, database, voice vocabulary, and work logic is server-based. Fulfillment operations can either self-host the solution on their private cloud/virtual server, or host the voice server at a cloud provider site.

The architecture not only handles high-volume picking transactions, but because of its low bytes per message, it minimally impacts the existing facility's wireless network. This is different from other voice technologies such as Voice over IP (VoIP), which requires a significant modification to the IT infrastructure network to accommodate the much larger size data packet messages generated by picks.

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Zero Training, a Key Advantage of Speaker Independent Voice

A key advantage of speaker-independent voice is it requires zero operator voice training for workers to become proficient in picking operations. The time it takes to get an employee up to speed with speaker-independent voice is much faster than manual paper picking, RF, or speaker dependent voice which can take several hours of training.

> *"Voice picking technology has proven to be the most efficient technology for cost effective and high accuracy picking."*

Pickers are productive in 15 minutes, so even temporary workers can be quickly and easily deployed during peak periods. The voice commands and responses are in a natural voice and support multiple languages. A worker can choose English, Spanish, Polish or many other languages and perform the work in their native language. Speaker-independent voice permits **more flexibility in cross-training of workers and interleaving work tasks**, leading to better labor utilization for picking, replenishment, and other work tasks. Additionally, the technology captures and time-stamps **all orders and labor usage for performance reporting.**

Speaker-independent voice capability highlights:

- Picking is performed and confirmed following lean efficient order picking processes designed to the order profile.
- Starts picks within the required zones, selects correct carton, combines voice and scan validation.
- Directs batch or discrete order picking in the shortest pick path.
- Picker confirmations are verified by scanning the item barcode, lot and or serial number picked.
- Directs pick and placement of items to cartons, conveyor, carts, and pallets.
- Direct work rules and move workers to the "hot" high volume work zones.
- The process requires no special training. It is remarkably easy to use, learn, and highly accurate, allowing single-touch pick-and-pack validation at near 100% accuracy rates that eliminate the need for secondary order inspection.

Speaker-independent voice integrates work instructions and verification into each step, for all pick types including pallet, mixed-case, or split-case piece picking. The ability to interleave picking, cycle counting, and replenishment across different order types is readily supported. Voice picking enables work force management to direct and move operators between work zones and work activities.

Labor tracking provides supervisors the ability to analyze individual worker productivity.

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A Top Tier WCS Further Increases Productivity in Omni-Channel Distribution

Many times complex order fulfillment automation goes beyond just adding voice to a DC, it requires a software platform to manage order release balancing to optimize the entire pick, pack, and ship order fulfillment operation. This is the domain of a top tier Warehouse Control and Execution System, (WCS) that includes software to balance and optimize order release to add further efficiencies to all components in the order fulfillment process. A top tier WCS manages and executes advanced picking strategies in combination with packing and shipping into a unified continuous order fulfillment process.

A top tier WCS manages and balances order picking across each channel, so e-commerce and retail orders can be simultaneously processed within the same DC. It bolts on advanced, best practices automation to control and execute order fulfillment, product tracking, and labor reporting to the existing ERP and WMS Systems. A top tier WCS includes voice picking, inspection, lot and serial number capture, and a full family of material handling automation modules that streamline the entire order fulfillment operation.

Cartonization Logic

E-commerce orders are primarily 1-2 line parcel shipments that require strict observance to dimensional weight. Consequently, tools such as cartonization software are required to perform pick-pack optimization and ensure orders are packed into the smallest available carton size and/or padded bag to control shipping costs. A top tier WCS combining advanced cartonization logic with order release directs the order picking to the optimum carton size. Voice commands then direct the order pick and pack verification direct to the required shipping carton or cartons. This is a critical need for both B to B and e-commerce operations. Single-touch pick-and-pack reduces touches, lowers packaging and shipping costs, and increases order throughput rates.

Labor-Tracking Management

The majority of omni-channel and e-commerce fulfillment centers track productivity at facilities in a macro manner. According to a 2014 research study sponsored by Kane Is Able, Inc., a leading supplier of 3PL services, distribution operations do not have a good a handle on individual worker productivity. According to the study, 57% of respondents consider "increasing workforce productivity" to be one of their toughest challenges. Considering the fact that labor accounts for 50% to 70% of a fulfillment center's operating budget**, it makes economic sense to use technology that increases labor productivity and simultaneously tracks worker productivity**. Again, a top tier WCS, with integrated speaker-independent voice technology eliminates operator training while adding worker accountability. Voice picking time-stamps each operator sequence in the operation to capture individual worker performance, measure worker's activity based on a work zone standard, and provides the reporting tools to recognize and **reward workers who exceed productivity and performance standards.**

Picking technology integrated with labor and order SKU pick data tracking enables real-time and historical reporting and analysis. Labor tracking provides supervisors the ability to analyze individual-workers, and provides a better training metric to guide new or underperforming workers. Additionally, data is captured to analyze work zone performance, evaluate SKU slotting, and re-profile underperforming pick zones. Management can use the data to perform labor planning for peak seasons, and Web based screens viewable

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on tablets or phones provide feedback in real-time to allow a manager to shift labor to other work zones and avoid bottlenecks before they occur!

Enables Perfect Order Fulfillment Practice

100% order accuracy is the ultimate goal of all order fulfillment operations. Equipping a DC with technology to direct pick-and-pack validation in a lean, low touch manner goes a long way to achieving the four principles of perfect order fulfillment practices: 1) complete order-fill accuracy; 2) on-time delivery; 3) damage free; and 4) correct documentation. Omni-channel and e-commerce DC's with their mix of high-volume case pick, and low count SKU order reap higher profitability and customer satisfaction with technologies that provide all four components of perfect order practices.

> *"Equipping order fulfillment operations with best practices and pick-and-pack validation technology will go a long way to achieving the four principles of perfect order fulfillment practices:*
>
> - *Complete order-fill accuracy*
> - *On-time delivery*
> - *Damage free*
> - *Correct documentation"*

Supply Chain and Operation Management Executives are well served to investigate the benefits of the accumulative productivity gains obtained through automated pick, pack, and ship processes. The cumulative effect of a unified, automated omni-channel order fulfillment operation managed with a top tier WCS combined with speaker independent voice boosts productivity much higher than a voice only solution providing 35% to 50% gains, and a rapid ROI in 12 to 18 months at many DC operations.

About The Numina Group

With 30 years of experience in warehouse and distribution process improvement design and warehouse control and automation services, The Numina Group provides engineering and turnkey service to implement advanced picking, packing, and shipping automation for order fulfillment automation solutions. The company delivers proven strategies and technologies that streamline operations at both existing and new distribution centers. Services encompass top tier warehouse control systems, voice and pick to light picking, packing, print and apply labeling, conveyor, high speed sortation, and other automated material handling technologies to eliminate bottlenecks, excessive labor, and improve operation profitability.

The Numina Group's Real-Time Distribution Software System (RDS™) is the industry's most powerful and scalable top tier warehouse control system (WCS) and includes a complete family of automation modules to seamlessly integrate pick, pack, and ship processes with conveyors, robots, print and apply labeling, and sorters into unified automated order fulfillment automation machines. For more information, contact Jen Maloney, Marketing Coordinator for The Numina Group, 10331 Werch Drive, Woodridge, IL 60517. Phone 630-343-2600, email jmaloney@numinagroup.com, www.numinagroup.com.

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