



“Put” Order Consolidation to **WORK** in Your DC

strategically improve e-commerce fulfillment productivity



Integrated fulfillment & distribution solutions for the supply chain.

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A New Retail Has Arrive.

The buzz around the exploding growth of e-commerce is deafening at times. It’s hard not to hear about the growing expectations of customers who want great product selection that can be purchased online and delivered within days, or even hours, to their doorstep. There is merit to the buzz as it is substantiated by the numbers. E-commerce sales grew 15.0% from September 2016 to September 2017 while total retail, excluding sales in restaurants, only grew 4.4% in the same period.¹ This indicates that e-commerce sales are becoming a larger percentage of retail sales. This phenomenon is impacting almost all retailers who want to retain or grow market share. Businesses that fail to recognize the emergence of e-commerce and adjust their distribution and delivery strategies accordingly run the risk of losing customers to competitors that can provide the same product more expediently.

The Impact to Distribution.

This change in customer’s shopping habits from an in-store experience to shopping in the comfort of home has a direct impact on the way that fulfillment centers must operate. To support traditional brick and mortar stores, fulfillment is

normally in the form of large orders for store replenishment or to roll out seasonal offerings and new product releases. These large orders present opportunities for full case picking of SKU’s combined with split case picking of units. The sheer size of the order allows for multiple units of the same SKU to be picked efficiently while minimizing visits to a storage location. This fulfillment strategy requires an infrastructure that supports pick-efficient full case or pallet movement. Split case unit activity is often handled through a “distribro” process utilizing either sorting technology (such as a tilt tray sorter) or a manual put-to-order system.

The processing of e-commerce orders is considerably different than a store fulfillment order. Depending on the retailer, store fulfillment orders could contain hundreds of lines and thousands of units. E-commerce orders are considerably smaller, normally consisting of 1 to 2 lines and 2 to 3 units per order. This translates into more effort required to pick an e-commerce unit compared to a store fulfillment unit due to the low number of units required per location. Each location visit is less productive and the amount of walking increases as locations are visited multiple times. Since picking typically requires the largest amount of labor in the DC fulfillment process, this transition from store fulfillment to

e-commerce fulfillment can have a huge impact on operating costs.

Gaining Back Productivity.

There are alternatives to improve pick productivity in an e-commerce environment. Grouping together many e-commerce orders and processing them at the same time will provide similar pick efficiencies as store fulfillment picking. This process is referred to as wave picking where multiple waves consisting of thousands of e-commerce orders are processed during the day. The units for a SKU are picked as full cases or by individual unit into totes without regard to the order they belong to but based on the total units required for that SKU for that wave. This allows for multiple units to be picked from a location with fewer visits to that location during the day. Multiple pickers are selecting a portion of the units required for the orders in the wave at the same time. These units will all flow on a conveyor to a downstream process called consolidation in which the units are assembled into their respective orders. A similar process called wave-less or continuous flow can also be used to group work together to gain pick efficiency by utilizing multiple pickers to pick the units required for an order. Both wave and continuous flow methods work well in an order consolidation process but for simplicity, we will only discuss how a wave process works in this paper.

The order consolidation process to support wave picking can come in many forms ranging from manual, low capital cost methods to fully automated, high capital cost solutions.

Each method has their own advantages and disadvantages and the method chosen will typically depend on the rates required, the number of orders, and the capital cost.

Order Consolidation Process	Advantages	Disadvantages
Manual sortation with RF or voice	Lowest capital cost, flexible	Increased labor, lowest productivity
Manual sortation with put-to-light	Lower capital cost, accuracy, increased productivity	Increased labor, may not support large orders
Automated sortation with bomb bay	High productivity, decreased labor	Cannot handle fragile items, flexibility
Automated sortation with tilt tray or cross-belt	High Productivity, decreased labor, supports case picking	High capital cost, may not handle products, flexibility
Automated sortation to put-to-light	Very large wave sizes, supports case picking, decreased labor	Very high capital cost, multiple product touches to consolidate

High volume e-commerce retailers and third-party logistics providers (3PL's) servicing many e-commerce customers can usually make a business case for utilizing automated sortation based on the labor savings gained versus a manual consolidation process. However, tilt tray and cross-belt sorters, along with the supporting conveyor system and software requirements, come at a significant capital cost. There must be large labor saving available for an acceptable payback period. For many retailers, especially e-commerce start-up companies, the daily processing requirements are low and the capital dollars are not available. A manual sortation process works well for these retailers because they can still take advantage of the pick productivity benefits of wave picking but with a less capital-intensive order consolidation process.

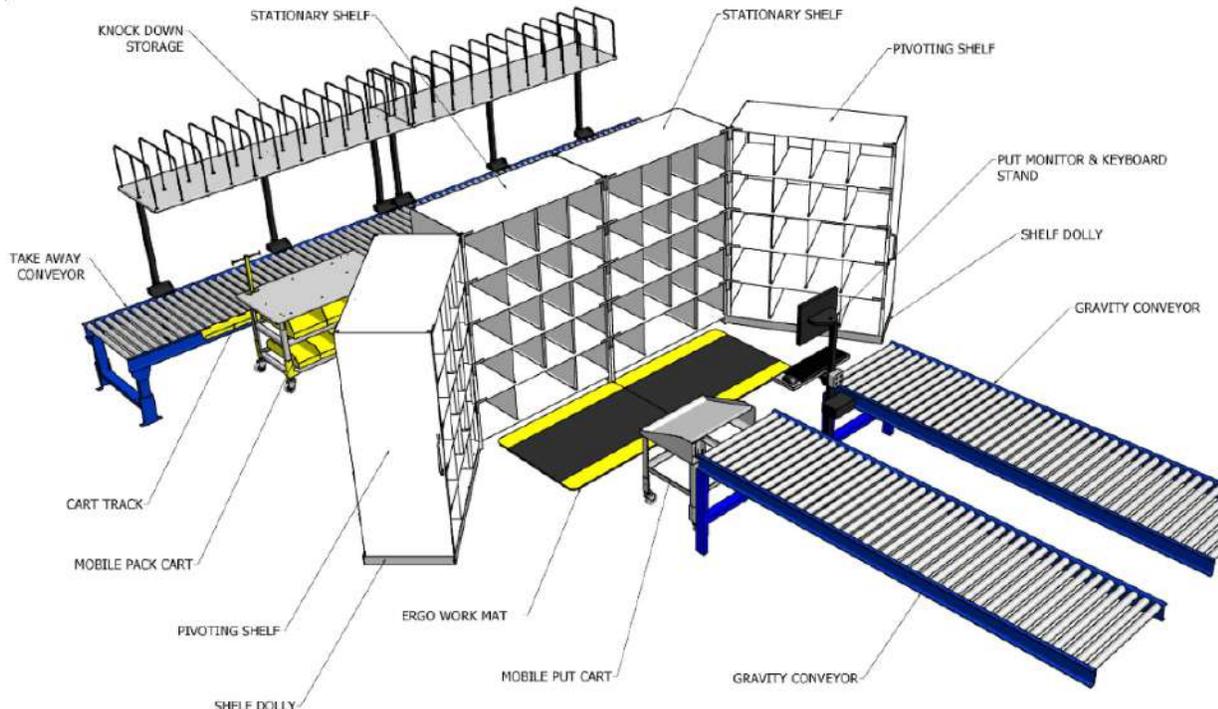
Put-to-Light Consolidation.

Manual sortation can be achieved using RF devices but a better alternative for a little higher capital expenditure would be to utilize a put-to-light consolidation process. This process not only allows for improved pick productivity but also improves consolidation productivity. A typical put-to-light consolidation process requires four main components: a conveyor system that feeds cartons or totes to the process, a physical structure where the orders are assembled, software that identifies the components of the orders, and a pack-out/takeaway conveyor area. In an operation where capital dollars are scarce, the conveyor system feeding the put pods and taking away completed cartons could be eliminated. A more manual approach, consisting of the product being moved in and out of the area using carts, can be accomplished. This may be a good alternative for start-up e-commerce businesses

who don't have an immediate need for a conveyor system but will require one in the future.

How Does Put-To-Light Work?

To fully understand how these components work together, let's start at the beginning of the fulfillment process. The most important component of an effective pick to order consolidation process is the software. The software is responsible for the assignment of pick instructions and the assignment of orders to a specific put pod and bin within the put pod. The warehouse management software (WMS), warehouse execution software (WES), or warehouse control software (WCS) will look at the available pool of orders and select the most appropriate group of orders for a pick wave based on user-defined parameters. The software will then divide this group of orders into smaller groups and assign them to a specific put pod (illustrated below) and each order to a specific bin within the put pod.



Once this assignment is completed, the software will then parse the orders into individual pick instructions based on the number of available pickers, the location of the SKU's, and the zone assignments of the pickers. Each picker will have pick instructions available to them typically either through an RF device or voice headset. Using totes with generic bar code license plates, the picker will "assign" themselves to multiple totes and the software will provide the pick instructions for those totes. Each tote is assigned to a specific put pod and only contains units for the orders in that put pod. The picker will then begin the pick process by traveling from location to location in their zone to pick the units required for the selected totes. This grouping of orders to multiple totes allows the picker to select all of the units for a SKU at one time and place them into the appropriate tote. This process eliminates the need to visit a specific location multiple times if picked at the order level.

When the units for a tote have been completely picked, the tote is placed on the conveyor system and is directed to the correct put pod. An operator at the pod will scan the bar code of the tote, retrieve one of the units from the tote, and scan its bar code. A light module button will illuminate adjacent to the bin where the unit is to be placed. The operator will place the scanned unit in the indicated bin and push the light module button to confirm completion of the task. The process of scanning and placing units is repeated until all units from the tote have been placed in their

When all the units for an order have been placed in the assigned bin, a light adjacent to the bin will illuminate on the back side of the put pod. This indicates to the order packer that the order is complete and ready to be packed for shipment. The light is extinguished, the units are removed, and the location bar code of the bin is scanned to confirm the order. Shipping labels are then printed as well as any other paperwork such as a pack list. The units are placed in a shipping container, any dunnage is inserted, the pack list is placed in the carton, the carton is sealed, and the shipping label is applied to the carton. The completed carton is then placed on the takeaway conveyor for transport to shipping.

Which Pod is Right for You?

Multiple pod configurations for order consolidation have been developed by the engineers at Advanced Handling Systems LLC. Each design has been developed to fulfill a specific need.

Rigid Wall Design

The most basic design is a rigid put wall which provides the lowest cost structure. This design is the most common throughout the industry. The lights are mounted to the frame either above or below each bin with a fixed mounted scanner located directly on the structure for scanning the individual units.



Ergo Wall Design

The ergo wall design is a modification to the rigid wall to minimize the travel distance from bin location to bin location when placing units. The two end sections of the put wall are hinged so they can swing in towards the operator 90°. With this design, the operator can access most bins within reach of the scanner increasing their productivity. When they have completed placing units in the bins on the mobile wings they are swung back into a straight wall configuration for ease of access to the packer.



Mobile Wall Design

The mobile wall design incorporates the ergonomic advantages of the ergo wall in a steel frame structure with docking, low-cost mobile wire shelf carts. The lights are mounted on the steel frame and the mobile carts dock in the frame when consolidating orders. Once the orders in a pod section are complete the mobile cart is undocked and moved to a pack area for completion and a new mobile section is moved into the docking structure. This design allows for the orders to be transported to specific work areas while keeping the put pod open for new, incoming orders. This works well if the orders need special packaging where the number of workstations is limited.



Productivity is Only Half the Story

Productivity is only one metric that is considered when assessing the success of a fulfillment operation. Order accuracy is just as important because incorrect order fulfillment results in unhappy customers as well as additional processing costs. One of the advantages of a put-to-light consolidation process is the level of order accuracy that is achieved. Each unit must be scanned and the operator is directed to the correct location to place the order. It is still possible, however, to incorrectly place the unit in the wrong location if the operator becomes distracted. There are options available to make accurate placement of units almost foolproof.

The first option is to include lighting within each individual bin so that the entire bin lights up as well as the button adjacent to the bin. This pinpoints exactly which bin the unit belongs so there is no confusion as to whether the button is located above or below the targeted bin. A second option is to include a sonic sensor that will provide a confirmation “beep” when the person’s hand has broken a light curtain at the front of the bin. Either of these options can be used independently or together to provide not only a visual but audible guide to correct unit placement.



“To Put or Not to Put”? That is the Question.

There is no simple answer or chart to reference that can tell a company whether they should incorporate a put-to-light order consolidation process for their e-commerce fulfillment operation. Because every business is unique, there are only general guidelines that may indicate that order consolidation should be considered. Typically, retailers who are transitioning from their start-up phase into a maturing business fit the profile of a company that is ready to consider moving from traditional discrete order picking to wave picking and order consolidation. As these companies continue to grow, more automated sortation options should be considered. Put-to-light can still play a major role in bigger operations by working in conjunction with an automated solution. Put-to-light processing can be used to handle the large spikes in activity that most retailers experience during their peak season(s). This allows for a low cost, low volume automated sortation solution to be implemented that will handle most of the volume during the year. This means that an investment in a put-to-light solution can continue to provide cost savings benefits as its role changes from the primary process to a secondary, support process no matter how large the company grows.

Summary.

Although there are many factors to consider when deciding whether order consolidation works for your company, there are resources to help in the decision-making process. The material handling experts at Advanced Handling Systems LLC have designed and installed over 600 put-to-light pods in over 20 sites for e-commerce retailers. Using their Analyzer process, the AHS team can perform the necessary analysis to help you determine whether it makes sense “To Put or Not to Put”.

Contact our experts at AHS, LLC for help! Call us at **800-891-5504** or email us today at **info@ahs1.com**.

References

¹Zaroban, Stefany “New government data suggests e-commerce sales jumped 15.7% in Q3” <https://www.digitalcommerce360.com/2017/10/13/new-census-data-suggests-e-commerce-sales-jumped-15-7-q3/> Accessed Nov. 16, 2017