

## SWITCHING TO WAVELESS PICKING FOR OPTIMIZED PERFORMANCE

Wave-based picking systems have been used as the standard to support planning and organization of the daily flow of work for warehouse order fulfilment for many years.

Waveless picking has emerged in recent years as an alternative pick and pack scheduling system. This whitepaper analyses the differences between these 2 types of systems and offers insights into advantages of waveless Picking and Packing. Optimization methods are also introduced to increase throughput by prioritizing the orders and totes.

### THE ISSUE WITH WAVES

Most distribution centers have wave-based order processing where many orders are released to the pickers in a single “wave”. However, wave-based picking systems do not incorporate out of the box flexibility to handle exception events, common variables (such as difference in real/actual speed of pickers) and real-time order streaming.

In this changing landscape, there seem to be 2 main supporting arguments for waveless. Of primary significance is the shift away from batch order downloads to the DC. Many retailers and 3PL's now receive orders in real-time – an operation that just does not lend itself naturally to wave-based picking.

The other argument lies in the fact that for wave-based systems to handle the unique order release needs of each company, heavy and expensive customizations are needed.

### OUTBOUND – A RECAP



Outbound operations usually include some or all the following list of processes:

1. Scheduling – Arranging and selecting the orders to be picked
2. Pick – Select the items for customer orders out of inventory for further processing
3. Merge – Merge them to a centralized location from multiple locations for further processing
4. Induct – Remove the items from totes to an automated system
5. Sort - Sort the group of orders into individual holding cells (Chutes)
6. Pack – Remove individual units from chutes, verify the contents and place in shipping container
7. Label and Manifest – Determine shipping method and apply invoice and labels
8. Ship – Process the group of orders into the appropriate transportation method

**PICKING** is result of the scheduling algorithm that involves the transfer of the product from an inventory storage location (Shelf, Pallet, Rack etc.) to a carrying tote or cart for transportation to the Sorting or Packing area of the warehouse. Picking is a strategy which should be chosen to best suit the needs of the operations.

These are some commonly used picking strategies:

#### ORDER PICKING

One order at a time.  
Pickers find each item on the list to complete the order.

- Decreased efficiency
- Not optimized

#### WAVE PICKING

Multiple order at a time.  
Can be manual or auto.

- Increased efficiency and productivity

#### CLUSTER PICKING

Workers travel to pick SKUs and place them to containers.  
Each container is a separate order

- Requires sophisticated assignments

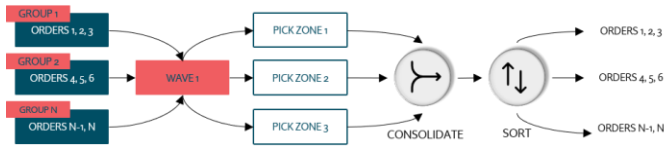
#### ZONE PICKING

Workers work within a specific zone.  
Each zone has its own storage system.

- Labor scheduling complexity

## WAVE PICKING

Wave picking is a common method of grouping similar sets of orders and releasing them in sequence (Wave 1 followed by Wave 2 etc.). Wave or batch picking is performed by allowing several orders to accumulate in the system and then strategically choosing a group of them (typically 30-90 for small batches, and up to 3x or more than that for larger waves). Waves are generally formed based on product density and customer promise, thus resulting in increased picker productivity.



Pickers spend less time walking and more time picking when multiple orders are grouped and picked together. On the other hand, wave-based systems self-impose the constraint that a batch must be completed before a new batch can be started. Unexpected events cause a wide range of batch completion times, resulting in low productivity for workers who finish early.

## WAVELESS PICKING

Waveless picking is a scheduling-intensive process where, rather than releasing an entire order into the system, items are released into the system one at a time. In practice, waveless picking allows for any item to be available as a potential next pick, subject to constraints such as system capacity, customer promised ship date, etc. This contrasts with wave picking where only items within the pre-created wave are available for picking.

Because waveless are “live” picks, there is no restriction on which items can be picked. The available pool of orders to pick can increase dramatically, thus increasing the density of the picks along the pickers path. This offers a great increase in productivity. Two major advantages are real-time scheduling and increased pick management.

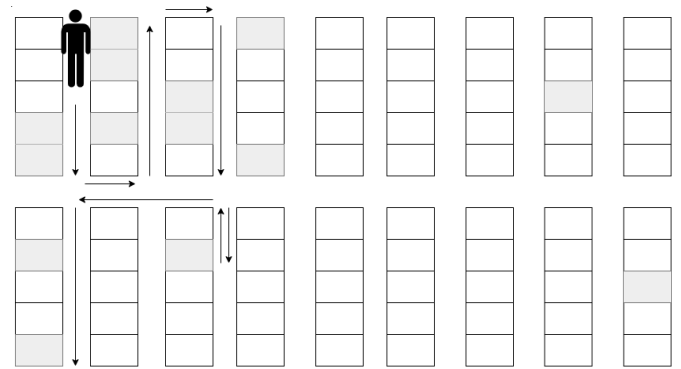
Real-time scheduling means that the system can react in real-time to orders that may drop into the system throughout the day. In a wave-based picking system, such orders would have to wait until another wave could be created to be picked, regardless of how close the items may be to other items in other waves that pickers may be currently scheduled to pick.

## ADVANTAGES OF WAVELESS PICKING

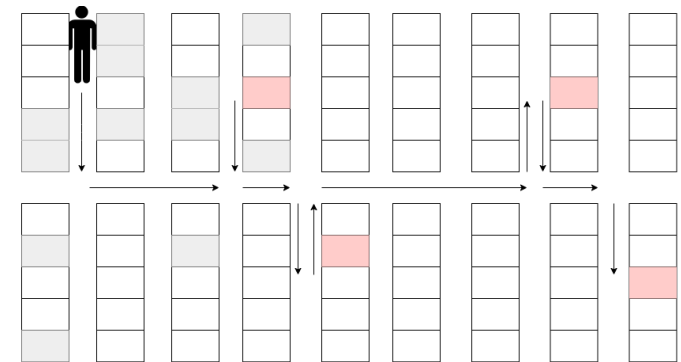
- Waveless processing eliminates work starvation periods for the pickers created by wave transitions — this means pickers are working consistently, not faster.
- Waveless processing reduces pickers’ walking by providing dense aisle picking (Dense aisle mode or Hot Picks mode)
- Waveless dynamically assigns the priority order while picking
- Waveless dynamically cancels the lower priority order during Cancel/NIL
- Waveless dynamically swaps the order with higher priority order during Packing
- Shorter cycle time
- No Wave buffers

## WAVELESS MODES

Dense Aisle Mode:



Hot Picks Mode:



## WAVELESS PACKING

Waveless also helps in dynamically swapping lower priority orders with higher priority orders during packing. This ensures improvement in customer satisfaction in terms of delivery without impacting the productivity of the operation.

Additionally, waveless provides for better exception handling during situations. For example, if an item (on a lower priority order) is missing in a tote, the waveless process can cancel the that order while ensuring a higher priority order can be shipped out.

## CONCLUSION

Waveless processing offers multiple advantages over traditional wave-based systems. It promises optimized order selection by anticipating unexpected events. Waveless processing will positively impact your bottom line by providing higher throughput, increased overall labor optimization, and enhanced customer service.

## COMPANY

As a team, we have the required expertise – both functionally and technically to build a waveless picking system.

As a company we are focused on creating value for customer's through building Optimizations, we help customers uncover opportunities within the four-walls of their operations. These opportunities for optimization specifically focus on increasing productivity and reducing cost of processing ecommerce orders.

Some sample opportunities may include:

- Optimizing picking using science-based optimization techniques to increase picking throughput and reducing costs.
- Optimizing warehouse space utilization and reducing storage requirements.
- Building predictive models to forecast labor requirements for handling inbound and outbound workloads.
- Creating graphical workload balancing dashboards which provide actionable insights on redistribution of workers on the warehouse floor.

## TECHNOLOGY

Our engineering capabilities are grounded in deep supply chain knowledge and decades of experience building hugely successful custom solutions for Retailers & eCommerce companies.



## TEAM

Our core team of Supply Chain & Retail experts bring in over 100 years of relevant experience.

Our experiences in retail and supply chain product strategy, technology and operations have helped Organizations succeed in their omni-channel and digital transformation journeys.

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