



Options to Improve Productivity at Your Piece Pick Distribution Center

Marc Wulfraat, President, MWPVL International

Options to Improve Productivity at Your DC

Introductions

Date	Time	Topic
6/28/2016	2pm et	Split Case Picking - What Works & Why
9/29/2016	2pm et	Options to Improve Productivity at Your Piece Pick Distribution Center

Role	Name	Company	Email	Phone
Moderator	Rich Hayden	Dematic	Richard.Hayden@dematic.com	(203) 468-2774
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Date	Event	Title	Location
September 11-14 th , 2016	31 st MHLC	The BIG CONNECT	Park City Utah
September 2017	32 nd MHLC	TBD	Park City Utah

Options to Improve Productivity at Your DC

Today's Speaker

Marc Wulfraat

Founder & President



Marc Wulfraat is President of MWPVL International, a global supply chain and logistics consulting firm specialized in helping companies with supply chain strategy, purchasing & inventory management, facility design, supply chain technology and distribution center operational improvements.

Marc has worked with hundreds of companies in North America and the rest of the world to optimize their distribution operations and supply chains. He has 30 years of experience in the strategies and tactics of the most effective logistics and distribution companies.

Marc has been a speaker at over 80 distribution-industry events and has been published in numerous industry publications. Marc has a B.Sc. Mathematics and M.B.A. from McGill University/Manchester Business School, UK.

Options to Improve Productivity at Your DC

Primary Goal & Focus



To improve labor productivity within the same four walls of your distribution center by deploying cost justifiable solutions suitable to the specifics of the warehouse operation



Options to Improve Productivity at Your DC

Unique Characteristics of a Piece Pick Distribution Operation

- ✓ Piece Pick DC's often have more than 100,000 SKUs in stock
- ✓ 5-10% of the inventoried SKUs constitute 80+% of the order line activity
- ✓ The need to pick at all vertical levels of the distribution center because of insufficient real estate at ground-level to provide pick facings due to the high variety of SKUs being stocked
- ✓ Low pick density and high travel time per order
- ✓ A ratio of putaway lines to pick lines that is in the range of 1 : 2, thus restocking labor is very labor intensive
- ✓ Wide variation in shape, size and weight of piece pick which requires multiple storage zones and picking strategies to optimize the operation
- ✓ Piece-Pick distributors must often ship orders within a very tight time window (e.g. 30 minutes)

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Measure Labor Productivity

- In the absence of defined labor standards, a scorecard of current labor productivity rates is a critical first step to better understand opportunities for productivity improvements within the operation
 - Measure each discrete job function by capturing the worked and paid man-hours and the throughput volumes (e.g. order lines, units, cases, cube)
 - Develop a simple table as shown in the next slide
 - Isolate job functions that are relatively inefficient
- Typically, in piece pick distribution centers, productivity gains can be achieved through techniques designed to increase pick density and reduce travel time

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E.g. Measure Productivity by Function

- Identify current productivity levels by job function and whenever possible benchmark against other similar piece pick distribution operations – see example below

Operations Component	Engineered Labor Standard (Lines/Hr)	Historical Labor Standard (Lines/Hr)	Benchmark Rates Comparable Operations (Lines/Hr)
Reach Truck Receiving + Putaway	10	8 - 9	10 - 15
Putaway	31	25	25 - 35
Picking - Bins	75	70	60 - 100
Picking - Lower Racks	53	45-50	50 - 75
Picking - Man-up Order Selector	23	20	20 - 35
Picking - Reach Truck	17	10 - 15	10 - 15
Packing	88	80	75 - 100
Shipment Processing	250 ctns/5.0 Hours	250 ctns/Shift	200 - 300
Kitting	114	105	N/A

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Discrete Pick Locations

- **Many piece pick distribution centers lack the notion of a discrete pick location per SKU**
 - A discrete pick location by definition; is a unique bin location address that is assigned to one part only such that the location is not shared with any other part (i.e. each pick location can only be assigned to one item only)
 - When a shelf level contains multiple SKUs co-mingled to a single shelf level, the operator must search through the SKUs to find the right one to be picked
 - The time penalty per pick transaction is approximately 5.75+ seconds in bin shelving and 3.45+ seconds in racking slots
 - This is due to the extra time required to search for the matching item number
 - Another way of saying this is that a pick rate of 67 lines per hour can increase to 75 lines per hour if each SKU has a discrete pick location
 - Establishing a discrete pick slot with a properly-sized pill box / bin container will have the dual benefit of speeding up the picking process and increasing picking accuracy

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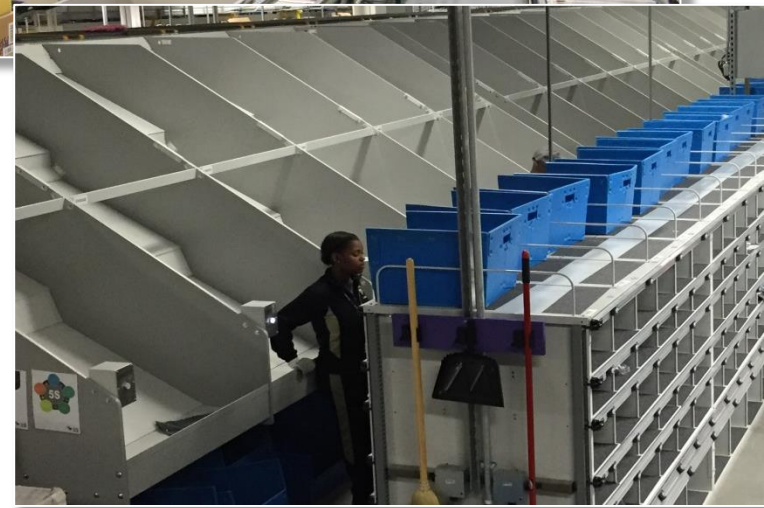
E.g. Vertical Parts Picking With Pill Boxes for Discrete Locations



Options to Improve Productivity at Your DC

Defining Picking Strategy Around Piece Pick Velocity

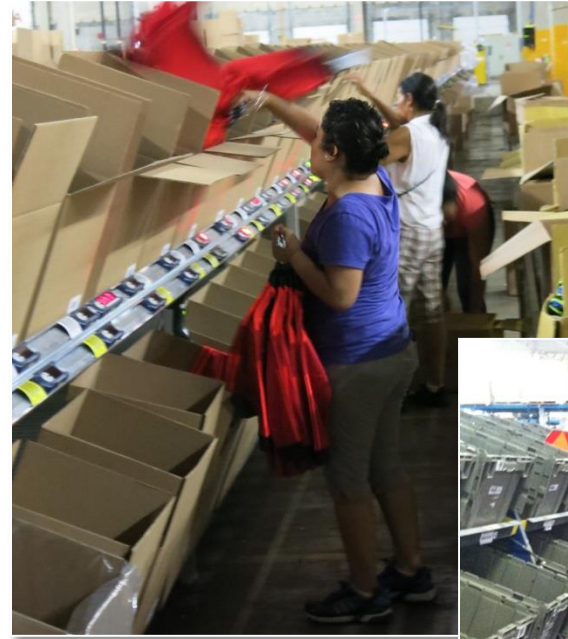
- Typically the top 5% SKUs generate 50% of order lines (A items)
 - Hot zones
 - Pick to Light
 - Reverse pick concept
- Next 5% of SKUs generate 25% of the order lines (B items)
 - Slotting strategies
 - Right size/location of pick slots
- All other SKUs - very slow moving
 - Dead zones
 - Mezzanines and takeaway conveyors
 - Vertical picking with man-up trucks
 - Stockchaser trucks
 - Cluster picking
 - Less attention needed for these SKUs



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High Velocity “A” Piece Picking Strategy : Hot Zones

- For “A” items, set up a high density picking zone with the goal to increase pick density and reduce travel time for both picking and putaway operations
- An ergonomically designed “hot pick” area combined with pick to light or similar technology can enable rapid order turnaround time combined with high levels of efficiency

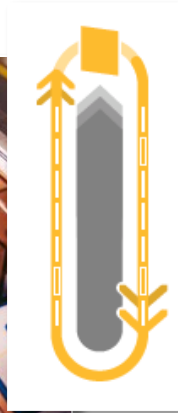


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High Velocity “A” Piece Pick - Picking Strategy : Pick to Light

➤ Pick to Light

- Typically applied for less than case pick in flow racks (or shelf bins) where faster velocity SKUs are being picked
- Highest levels for picking accuracy – typically in the 99.95% range
- Pick productivity typically in the 100 – 250 lines/hour range depending on order density
- Configured for either Pick & Pass, Zone or Racetrack Flow
- Ability to Work Load ReBalancing
- Cost of pick to light system is a function of the number of pick locations that require lights so it makes most sense to use this technology for say the fastest 2 – 3,000 piece pick



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Medium Velocity “B” Piece Picking Strategy : Carousels

➤ Horizontal Carousel

- Suitable for small cube SKUs that are medium to high velocity in terms of “hits”
- Efficient space usage due to elimination of operating aisles
- Downside is that they need to be shutdown during a quiet time to be replenished
- Pick rates can range from 150 – 600 lines per hour (average is 250 - 300) and are a function of:
 - 2 vs. 3 vs. 4 carousel pods per picker
 - Batch pick 12 orders at a time with put to light
 - Riser platform
 - Scanning confirmation requirements



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Mid-to-Slow Velocity “B/C” Piece Picking Strategy : Mini-Load

➤ Goods to Person Mini-Load ASRS:

- At receiving, products are placed into standardized entities (containers or pans) that get conveyed to induction points for the Mini-Load ASRS system
- ASRS automatically stores & retrieves containers into a storage buffer
- ASRS extracts and deposits containers either to dynamic floor-level pick locations or to conveyors for transfer to picking workstations
- Operator picks required SKU/Quantity and container with residual inventory is conveyed back to ASRS miniload to be returned to storage
- Throughput capacity of Miniload ASRS limited to the machine’s vertical & horizontal speed (70 – 150)

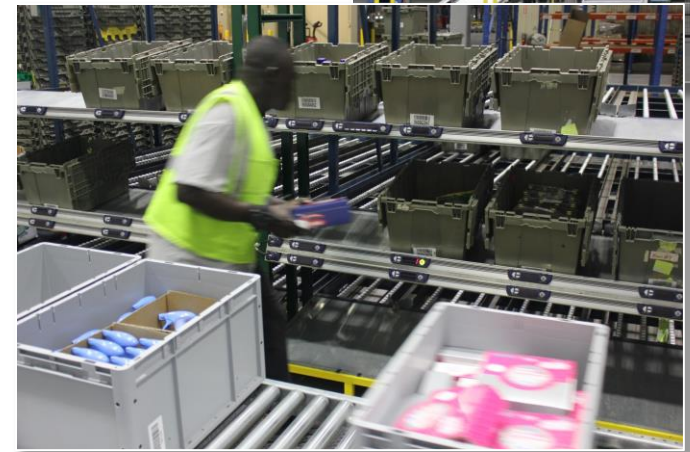


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Mid-to-Slow Velocity “B/C” Piece Picking Strategy: ASRS w/GTP

➤ ASRS Pick to Zoned Put-to-Order Stations

- The system configuration supports high picking productivity and order picking accuracy while fitting into a compact footprint.
- Workers are not required to walk to each pick face, instead the SKUs are automatically brought to them.
- In addition, manual replenishment of pick faces, slotting, and re-slotting are omitted as the inventory is staged in an automated storage system.
- Zoned PutWall Stations allow for a higher through-out rate
- Light-directed put-to-order: 440–480 reaches per operator per hour
- Multishuttle: 12,000 tote positions per aisle (typical), 15–18 levels



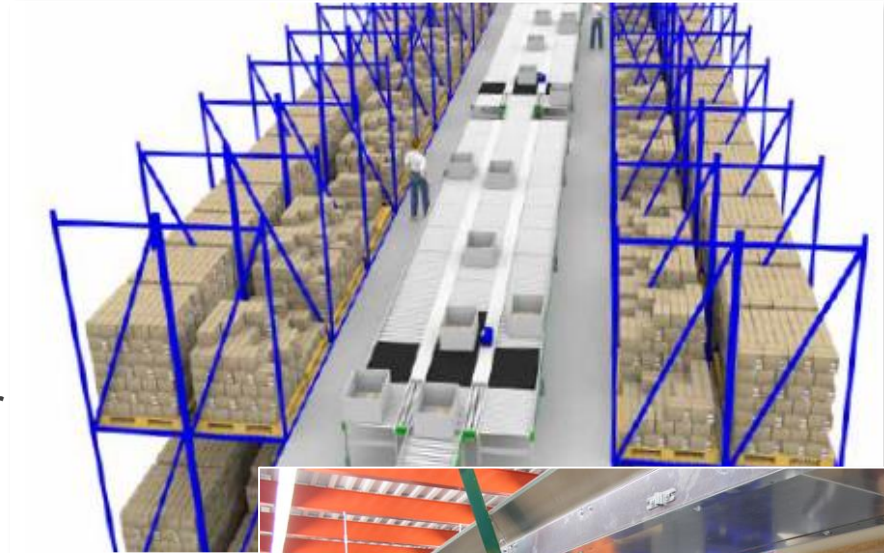
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Mid-to-Slow Velocity “B/C” Piece Picking Strategy

Mezzanines & Zone Transfer Conveyors Slow Velocity Parts

➤ Conveyors

- 2nd Level mezzanine and ground level shelf picking
- Shelves run perpendicular to takeaway conveyor
- Small piece pick are picked into cartons or totes for transfer to another pick zone or to packing
- Zone picking – more than 1 operator works the order
- Cluster picking – picker works multiple orders at a time
- Audit process for 0.5% of orders
- Mechanized takeaway conveyors to sortation to pallets



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Mid-to-Slow Velocity “B/C” Piece Picking Strategy

Hybrid Goods-to-Person Batch Pick to eCom PutWall System

- Scalable and modular solution that optimizes piece picking process
 - Solution serves as a batch pick and consolidation method that brings high productivity, order accuracy, speed and efficiency to order fulfillment
 - Solution combines order lines from multiple orders and creates high density, efficient picking throughout the warehouse.
 - Scalable design accommodates growth
 - Typical volume 1,000–20,000 ord/shift
 - Coordinated Pick, Put & Pack processes
 - Typically 20 to 30 minute targeted turn rate on each PutWall
 - Voice and/or Light-Directed
 - From 99.5% to 99.9% order accuracy



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Slow Velocity “C” Parts Picking Strategy: Pick-to-Cart

Cluster Picking Strategies for Slow Velocity Piece Picking

- Pick & Put items to the discrete order carton on the Cart
 - E.g. 16 – 32 orders are picked and sorted concurrently
 - Can be deployed in slow moving areas of the warehouse where bin shelving is used (e.g. mezzanines)
 - Typical 75 – 110 lines per hour pick rate depending on many factors
 - Lightweight design
 - Cartons/Totes can be removed and deposited to takeaway conveyor
 - Lights or Voice-Directed Picking



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Slow Velocity “C” Parts Picking Strategy

Stockchaser Trucks

- A stockchaser truck (e.g. Taylor Dunn) is a vehicle that allows a picker or stoker to quickly travel the warehouse
 - Operator can access product at ground level
 - Stockchasers can pull a cluster-pick carts
 - Typical truck/cart configuration can hold up-to 60 ship-to-cartons. Additional carts maybe added
 - Cartons/Totes can be removed and deposited to takeaway conveyor
 - Voice-Directed Picking; 100 – 160 Order Lines per hour



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Slow Velocity “C” Parts Picking Strategy : Man-Up Order Pickers

Vertical Picking – Man-Up Order Picker Trucks

- VNA aisles can be configured to be as narrow as 48” with wire guidance
 - Product is hand stacked into vertical rack locations with wire mesh / plywood decking
 - Strategy for larger SKUs that do not fit into shelf bins
 - Slot fastest “C” items at ground level to reduce vertical travel
 - Pick rates vary but will often be in the range of 50 – 75 lines per hour
 - Truck Mount RF Scan or Voice-Directed



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Optimizing the Packing Function

- Packing Table Layout and Design is critical to maximizing the productivity of this function
 - Understanding how to improve the packing function basically requires insight from having been exposed to other distributors that do well at this function.
 - Pack rates typically range from 75 – 100 lines per hour for piece pick distributors.



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Options: Voice Directed Picking (VDP)

➤ Voice Directed Picking

- Flexible because the technology can be used in all areas of the warehouse.
- Most applicable to areas where two hands are needed for the job
 - Heavy Full Case (e.g. oils, fluids)
 - Bulk products
 - Tires / Exhaust pipes, etc.
- Cost of the technology is a function of the number of pickers using voice.
- Accuracy levels are higher than RF picking because of less quantity errors and eyes always on the job.



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Options: Slotting Systems

➤ Slotting

- Software to continually optimize pick slot assignments to piece pick
- Tends to require a ½ full time inventory person to make this work.
- Reslot every quarter or every major season
- Only useful if it is used – start-up time can be 4 – 6 months
- Keep fastest “hit” items at the end of the shelf runs to minimize travel into pick aisles
- \$75 – 100K typical investment

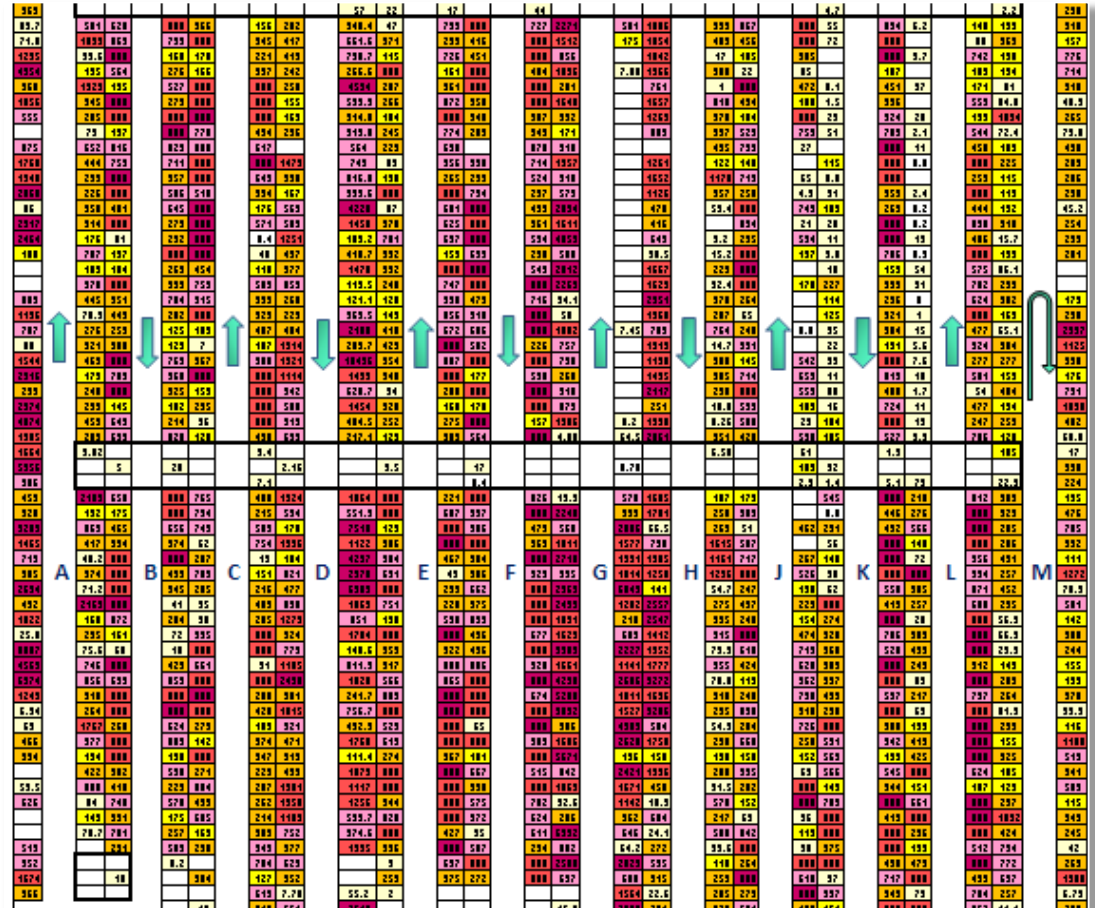


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Options: Warehouse Heat Map

➤ Warehouse Heat Map

- Used to analyze where labor has been most active in the warehouse
- Can be used to visually analyze where the most “hits” have been taking place so that reslots can be made for the worst offenders



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Recap and Conclusions

- Piece pick distribution centers generally suffer from low productivity rates because they have large SKU populations and most of the piece pick are ordered at most a few times a year
- This presentation highlights the importance of developing picking and storage strategies by the notion of velocity class
- Techniques in this presentation are designed to increase pick density and reduce travel time
- There are different technologies and material handling equipment solutions that are most suited to each of the strategies identified in this presentation

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Additional Resources



White Papers:

- http://www.mwpvl.com/html/order_pick_technologies.html
- http://www.mwpvl.com/html/dematic_multishuttle_review.html
- http://www.mwpvl.com/html/warehouse_heat_map.html
- http://www.mwpvl.com/html/warehouse_slotting_optimization.html

Pick & Put Systems:

- Pick-by-Light: <http://www.dematic.com/na/pick-to-light>
- Pick-by-Voice: <http://www.dematic.com/na/voice-picking>
- Pick Carts: <http://www.dematic.com/na/pick-carts>
- Pick & Put Stations: <http://www.dematic.com/na/pick-and-put-stations>
- Rapid Pick Systems: <http://www.dematic.com/na/rapidpick-system>
- FlexTruck Voice: <http://www.dematic.com/na/flextruck-voice>
- Put Wall Solutions: <http://www.dematic.com/na/split-case-picking-solutions/put-to-order-solution>

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Q&A



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