Multi-Channel Distribution

Align Your Fulfillment Operations With Your Changing Channel Mix

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MHI

3 Takeaways

Gone are the days of single-channel retailing

Single, multi-channel DC vs. separate DCs

- It's not an easy answer
- It's bigger than a distribution question

Data – let it guide your design

- 3 very specific examples

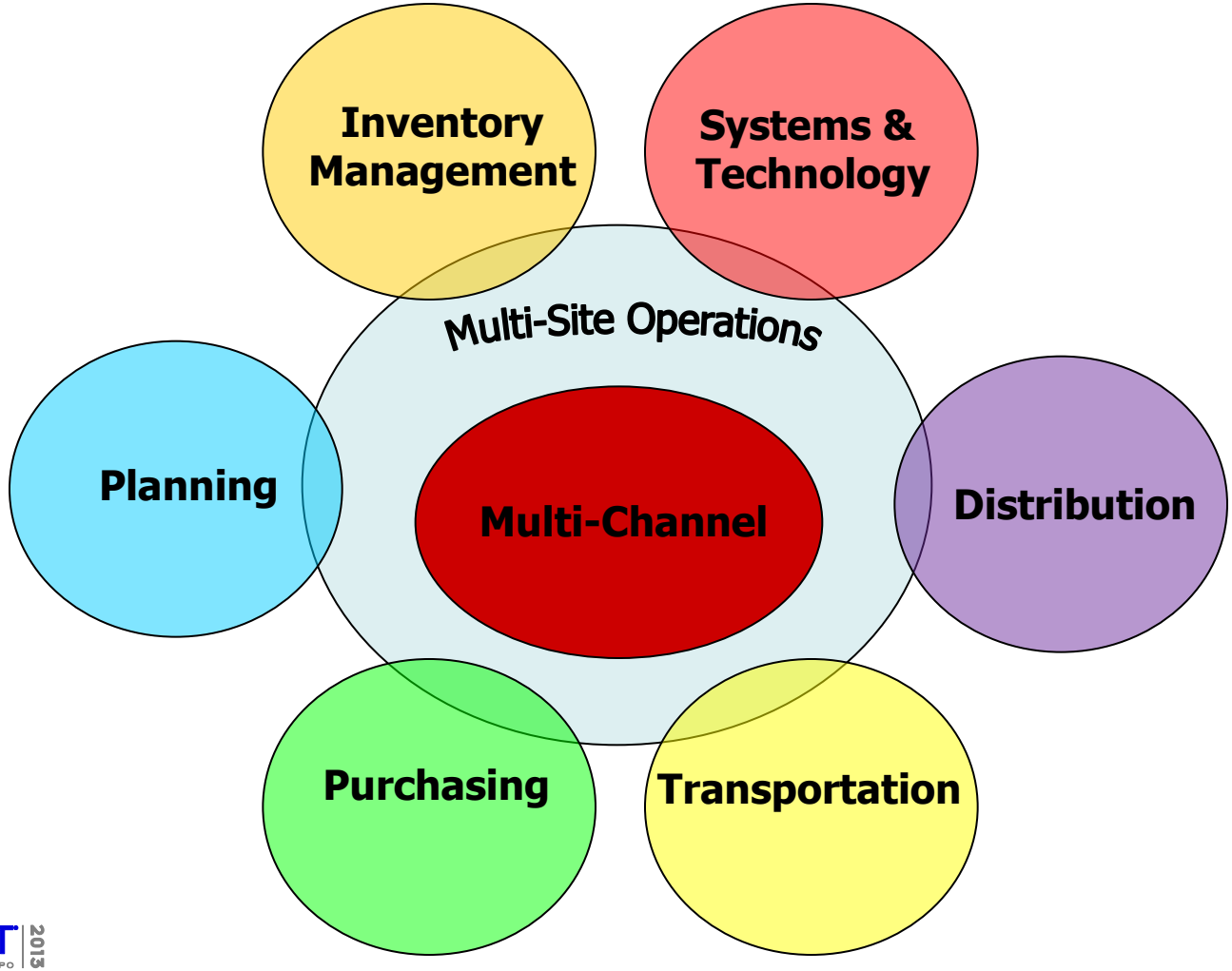
Gone are the days of single-channel retailing

Multi-Channel Impacts:

- Balancing extreme service demands with rising costs
- Visibility & systems requirements across channels
- Distribution approach
- Complicated inventory management
- Complex transportation requirements
- Reverse logistics

Source: Amy Patridge, Inbound Logistics Article – "You Are Everywhere: Mapping the New Retail Supply Chain"

Multi-Channel & Multi-DC Considerations



Optimizing Multi-Channel Distribution

- Service – cycle time
- Product packaging
- Inventory sharing
- Order profiles
- SKU profiles and velocity
- Picking methodologies
- Value-added services
- Labor sharing

Data – let it guide your design

3 Examples

1. Alignment of flow paths across multiple channels

2. Extreme daily variability by flow path / order profile

3. Differences between peak and off-peak

Example 1

Alignment of flow paths across multiple channels

Characteristic	Comments
Vertical	• Apparel
Channels Involved	• Retail • Wholesale (& Wholesale eComm) • eCommerce
Relative Volume	• 750,000 daily units • 1,500,000 peak daily units
Challenges	• Rapid growth and a changing business model • Multiple DCs handling multiple channels and business units • Needed to determine if a multi-channel DC “made sense”

Does it make sense to combine channels in one DC?

Category	Driver Description	Retail & Wholesale	Retail & eComm	Wholesale & eComm	Retail, eComm & Wholesale
Service	Cycle Time	0	2	0	2
Inventory	Product Packaging	4	0	0	2
Inventory	Sharing	4	2	2	3
Customer Service	Outbound Packaging	2	0	0	2
Facility Design	Recv/Crossdock	3	2	2	3
Facility Design	Putaway & Storage	3	2	2	4
Facility Design	Order Profile	2	3	0	2
Facility Design	Breadth/Depth – Fixed SKUs vs. Fixed Orders	0	0	3	2
Facility Design	Picking Methodology	3 If Batch Picked	2 If Batch Picked	3 If Order Picked	3
Facility Design	VAS/Packing	0	0	3	2
Facility Design	Shipping / Carrier	0	3	0	2
Peak Smoothing	Labor Sharing	2	2	3	4

4 Very High Correlation **3** High Correlation **2** Some Correlation **0** No Correlation

Order profiling to define the optimal operating methods

	Pick (Orders in front of SKUs)	Put (SKUs in front of Stores/Orders)
Static	***Pick Module*** Pass order cartons in front of fixed SKU facings Discrete Order Completion	***Put-to-Store*** Pass SKUs in front of fixed store carton facings Batched Orders to Manual Consolidation
Dynamic	***Dynamic Fulfillment Module*** Pass order cartons in front of active wave SKU facings Batched Stocking & Discrete Order Completion	***Put-to-Order*** Group SKUs and sort to "active" orders Batched Orders to Manual Consolidation ***Unit Sorter*** Batched Orders to Automated Consolidation

Pick Module	
Lines per carton	Low
Destinations per wave	Large #, unknown
SKU breadth	Small/Medium
Batch Line Reduction	Low

Put-to-Store	
Lines per carton	High
Destinations per wave	Fixed / consistent
SKU breadth	Large
Batch Line Reduction	High + some full case pulls
Other	Store ready cartons, product presentation

- Greater scalability
- Faster cycle time
- Order accuracy
- High sortability

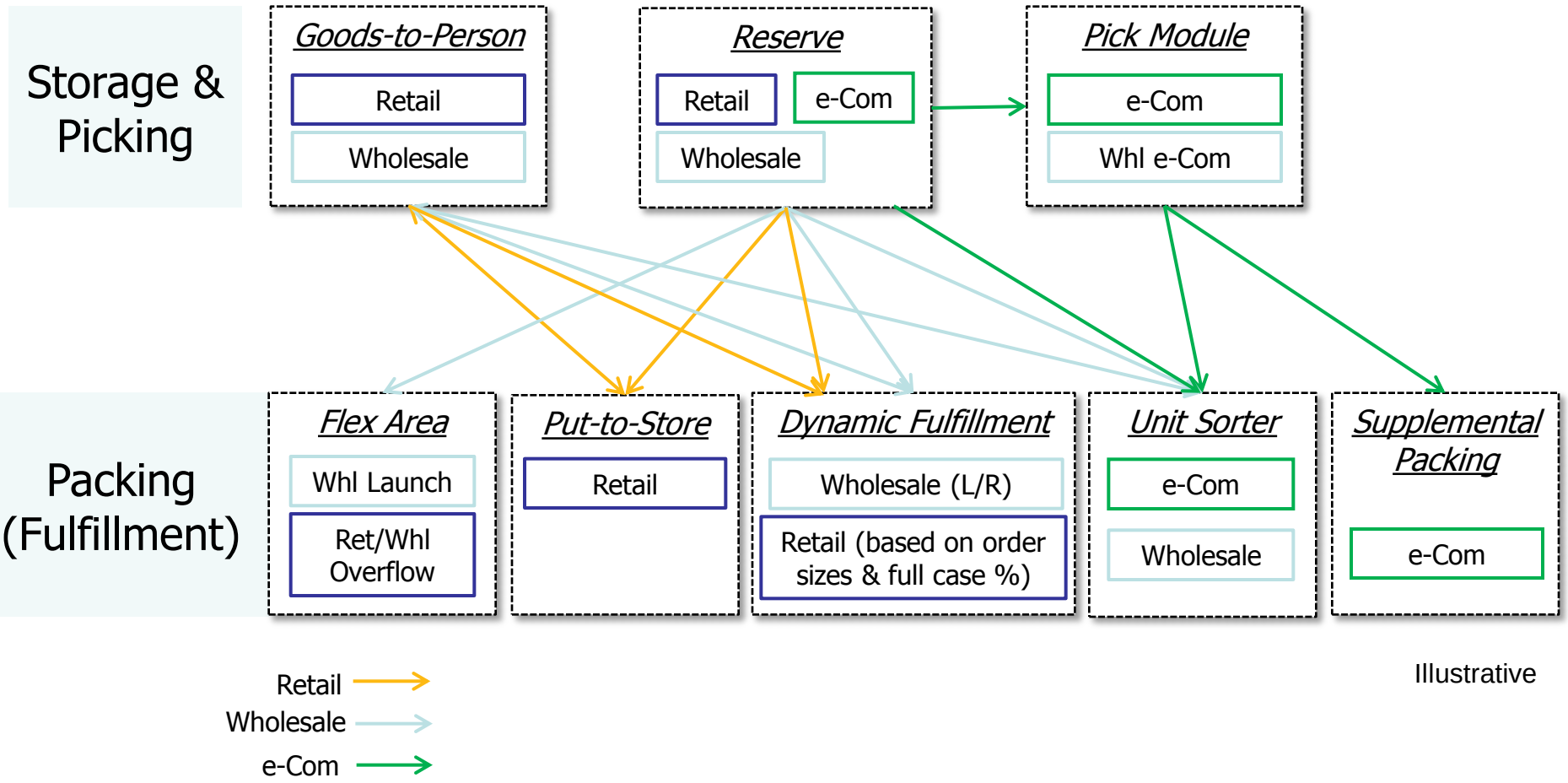
Dynamic Fulfillment Module	
Lines per carton	Low
Destinations per wave	Large #, unknown
SKU breadth	Larger count, Seasonal
Batch Line Reduction	High + some full case pulls

Put-to-Order / Unit Sorter	
Lines per carton	High
Destinations per wave	Higher, but consistent
SKU breadth	Large
Batch Line Reduction	High + some full case pulls

Illustration

Category	e-Commerce	Retail Replen	Wholesale Replen
Receiving	Manual: No Equipment; Unload Conv & Palletize; Recv Sorter	Manual: No Equipment; Unload Conv & Palletize; Recv Sorter	Manual: No Equipment; Unload Conv & Palletize; Recv Sorter
Picking Methodology	Batch Pick w/ Full Case /LTC Split; Batch LTC Nested Waves; Batch LTC Single Wave; Cluster Order Pick	Batch Pick w/ Full Case /LTC Split; Cluster Order Pick	Batch Pick w/ Full Case /LTC Split; Cluster Order Pick; Zone Pick Partial Totes & Consolidate
Full Case Picking Equip	Minimal Full Case Opportunities	Pick from Reserve; Full Case Fwd Module	Pick from Reserve; Full Case Fwd Module
Less-Than-Case Picking Equipment	Goods to Person Shuttle; Pick Module w/ Zone Routing; Pick Module w/ Cart Picking	Goods to Person Shuttle; Pick Module w/ Zone Routing	Goods to Person Shuttle; Pick Module w/ Zone Routing
Goods-To-Person Usage	Not Applicable (decision tree)	Residuals; LTC	Mirrored Pick (C&D velocity finish ord); Resi-duals; LTC; 100% By Chan; finish orders (no retail)
Replenish-ment	Replen Sorter; Pallet Deliv to Wing Rack & 2nd Stock; Case Deliv direct to flow	No Pick Module (based on decision tree)	No Pick Module (based on decision tree)
Buffer / Stage	No Buffer – Bulk Pick to Belt; Manual Buffer (Tote Stack); Automated Secondary Sort	Full Case Staging Buffer; Immediate Throw-On Line & Deliv	Full Case Staging Buffer; Immediate Throw-On Line & Deliv
Packing	Unit Sorter Single Order; Unit Sorter Multi Order with 2nd Sort; Consolida-tion / Put-To-Order	Unit Sorter; Put To Store w/ RF; PTS w/ Lights	Unit Sorter; Dynamic Fulfillment Area w/Lights; Put-To-Order with Lights
Shipping & Other Outbound	Shoe Sorter; Sort Bags to Totes; 2nd Dock Sort by Carrier; Belt Conv to Tilt Tray Sorter Share 2nd Unit Sort	Print & Apply; Semi-Automated Taping; Fully Automatic Sealing	Print & Apply; Semi-Automated Taping; Fully Automatic Sealing; Pack Slip Insert

What is the optimal flow path across channels?



Example 2

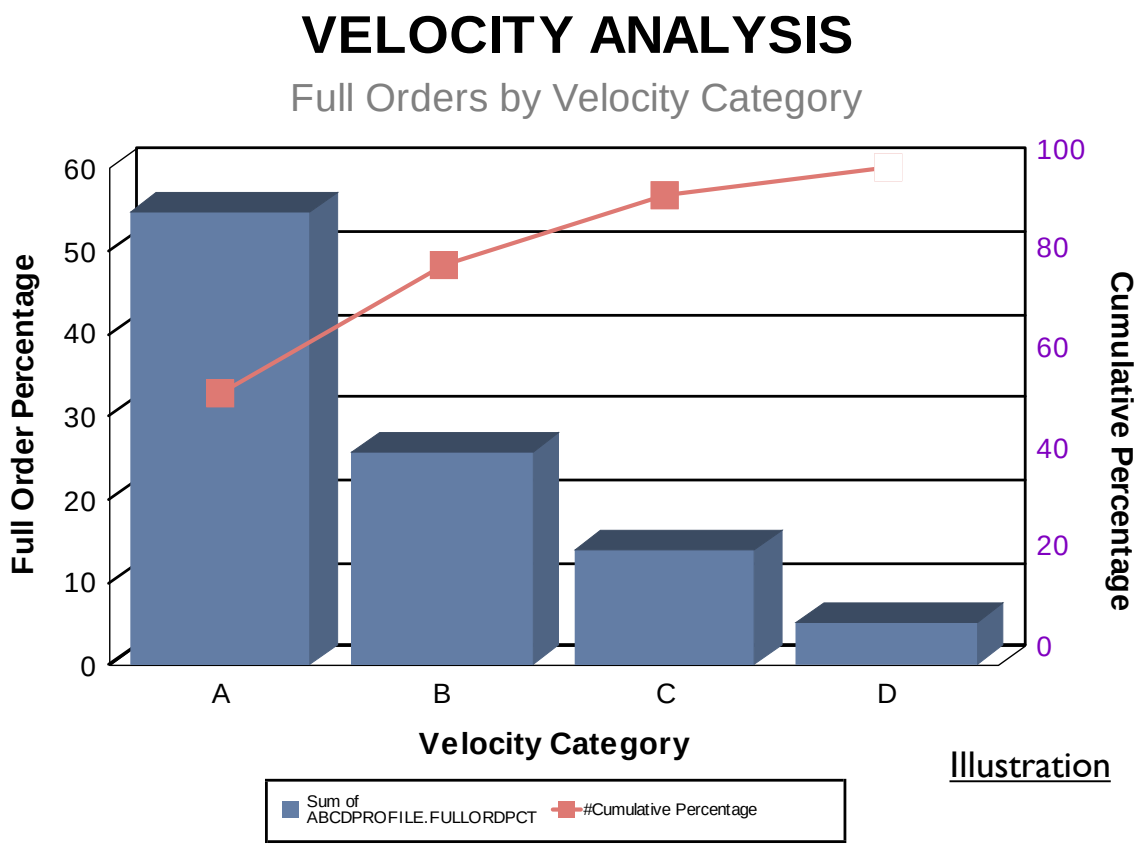
Extreme daily variability by flow path / order profile

Characteristic	Comments
Vertical	• Sporting Goods
Channels Involved	• Retail • Wholesale • eCommerce
Relative Volume	• 1,000,000 daily units
Challenges	• 15% annual growth across all channels • Storage and throughput capacity constraints • Desire to retrofit existing operation

SKU Velocity Analysis

Goal: Find ways to extend the existing unit sorter

Result: Most orders could be completed with A & B velocity SKUs
Other orders were off-loaded from the unit sorter

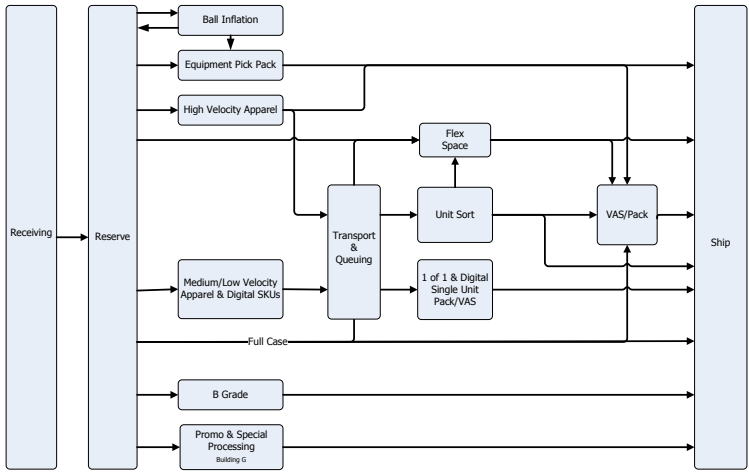


Illustration

Flow Paths

Optimal design: Multiple flow paths sized for the varying daily demand

- Discreet order pick for equipment
- Discreet order pick for high velocity SKUs
  - Completes high % of orders
  - Offloads volume off unit sorter
- Batch pick and unit sortation for majority of orders
  - Completes high % of orders
  - Most efficient pick for lower velocity SKUs
- Common VAS area for all orders



Illustration

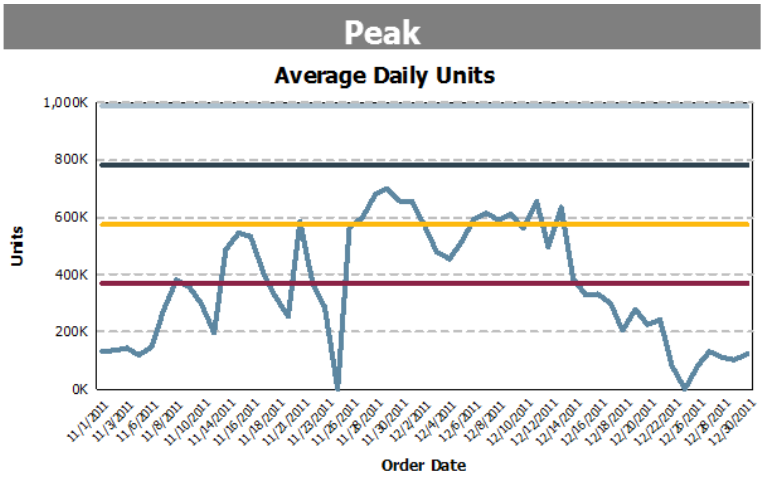
Example 3

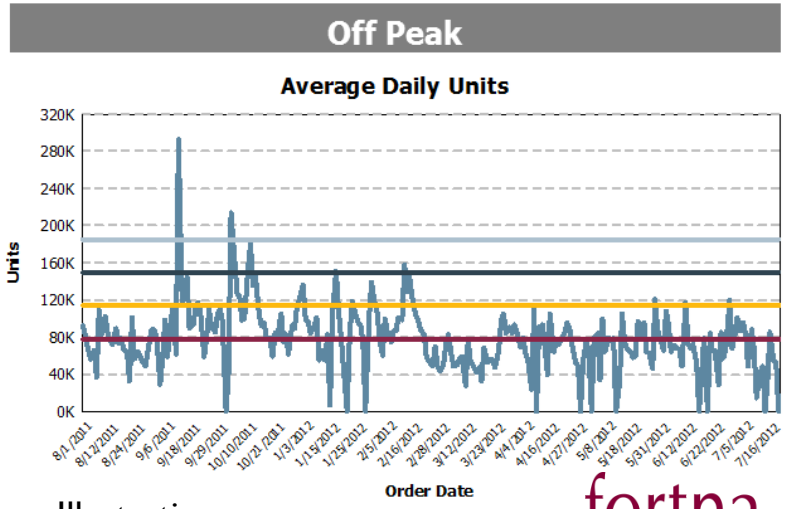
Differences between peak and off-peak

Characteristic	Comments
Vertical	• Outdoor Apparel and Sporting Goods
Channels Involved	• Retail • eCommerce
Relative Volume	• 450,000 units per day (peak)
Challenges	• Achieve best processing efficiency without over-capitalizing DC • Addressing existing unit sorter capacity constraints • Supporting continued growth

Unit Volume

- Peak vs. Off Peak
  - Average daily units vary by 5X
  - Average low units vary by 18x
- Lines per order increase during peak: 75%
- Units per order increase during peak: 68%



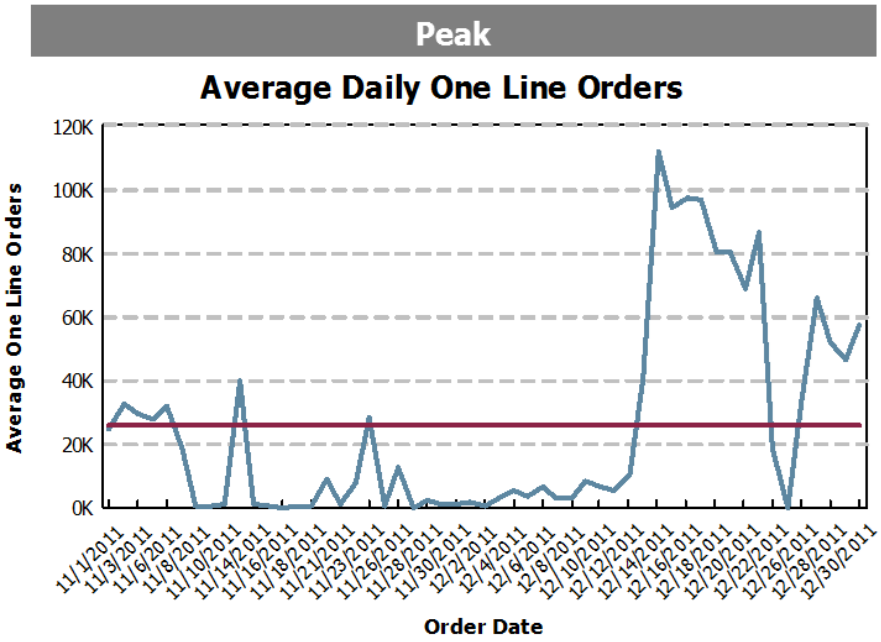


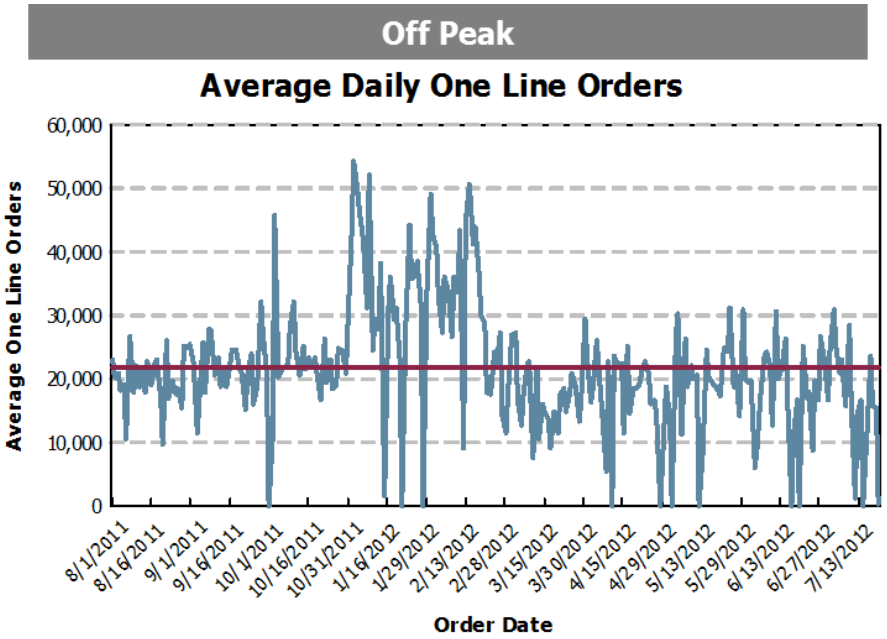
Illustration

One Line Orders

Off-peak: 60%

Peak: 25%



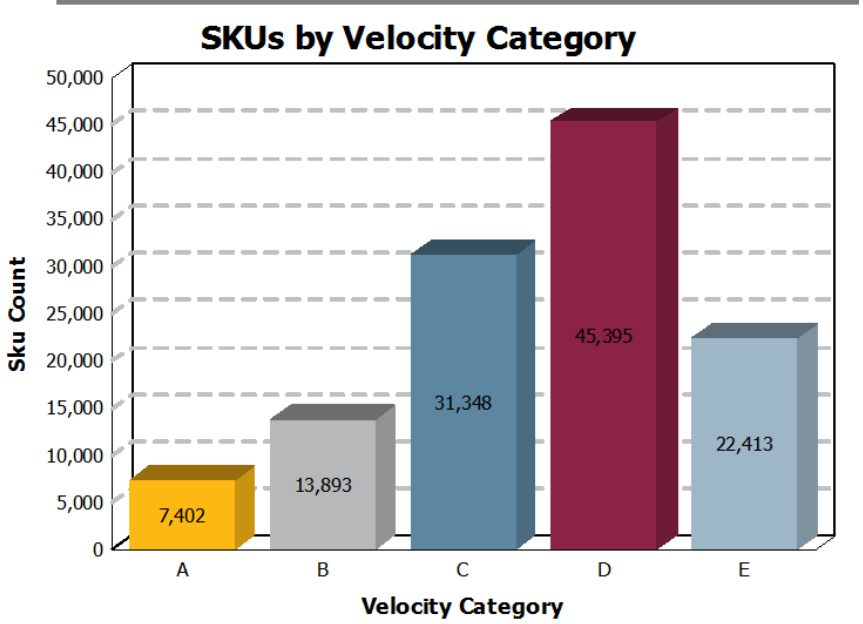


Illustration

SKU Velocity

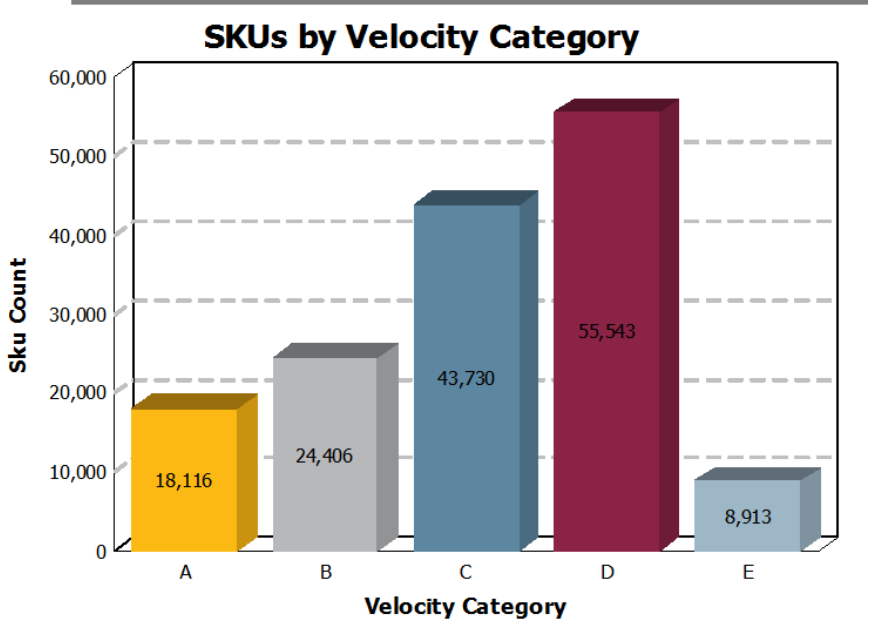
More “A” SKUs during off peak

Peak



A	7,402	6.15%
B	13,893	11.53%
C	31,348	26.03%
D	45,395	37.69%
E	22,413	18.61%
Total	120,451	

Off Peak



A	18,116	12.02%
B	24,406	16.19%
C	43,730	29.02%
D	55,543	36.85%
E	8,913	5.91%
Total	150,708	

Illustration

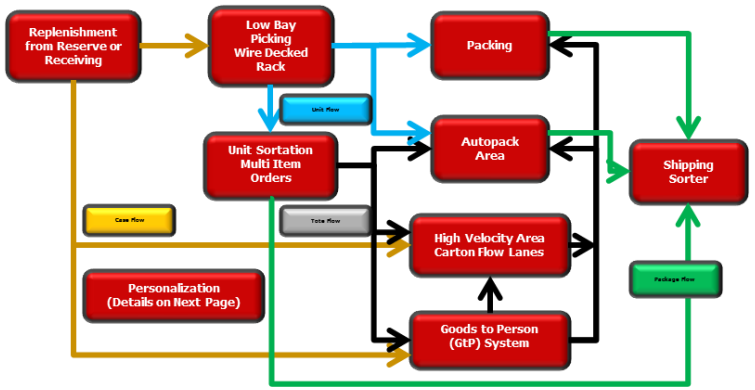
Flow Paths

Optimal Design:

Size capital equipment for off-peak

Use off-line processes during peak

- Discreet order pick for equipment
- Discreet order pick for high velocity SKUs
- Batch pick and unit sortation for majority of orders
- Common VAS area for all orders



Illustrative

Summary

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