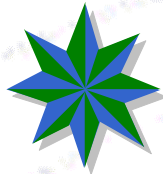


Managing Product Diversity for a Leaner Supply Chain

Todd Burger

Jeff Wickham

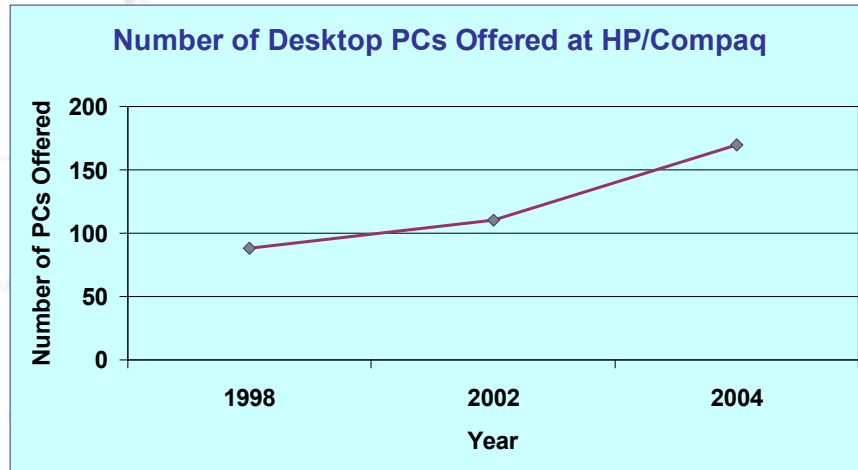


Crackerjack Consultants

Product diversity is increasing, stressing the supply chain

Trend	Example
Mass customization in consumer products	Computers - Dell
Shorter product high-moderate sales lifecycles	Scooters - Brookstone
Products with "Long Tails"	Shoes - Hush Puppies
Competitive pressures to broaden product lines	Computers - HP

Growing Complexity is Straining Supply Chains....



Source: Cargille, Fry, and Raphael, *Managing Product Line Complexity*, *OR/MS Today*, June 2005.

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Diversity compels active management of product traits

Traditional	More Important	Emerging
<ul style="list-style-type: none"> • Density • Value • Bulkiness • Velocity • Tax 	<ul style="list-style-type: none"> • Quality • Reliability • Lot Variability • Fragility / Packing quality • Replenishment lead time 	<ul style="list-style-type: none"> • Ability to counterfeit • Lifecycle • Legitimacy /public acceptability <ul style="list-style-type: none"> – labor practices – environmental practices

Career-ending Averages

- Profitability
- Inventory turns (based on total inventory)
- Days sales on hand based on past week's or month's sales
- Average transit times
- Typical product size

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Case Study: Retail Supply Chain

Major national retailer
(parent co.)

- Seasoned management team
- Hundreds of profitable stores
- Excellent track record
- Sophisticated, detailed financial oversight
- Public company

Heaven on Earth
(subsidiary)

- Performance below expectations
- Belief that some products lost money
- Experienced managers, but new business model
- Ready for 20 store expansion?

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Product-level supply chain cost allocation model

- Purchase
- Transport
- Receiving and In-store handling
- Warehousing
- Retail clerks' time
- Store sales space allocation
- Damage and returns costs
- Energy and trash costs

Top 3

Bottom 3

54%

-298%

53%

-98%

51%

-99%

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Retail Supply Chain Analysis

Follow
the
Money

- Key cost drivers related to fundamental aspects of business
- Money losers were a surprise
- Sales strategy muddled in confused supply chain execution

Advice

Re-think marketing strategy to incorporate supply chain choices

Result

Deferral of expansion

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Automotive Service Parts

Challenge

Stock more parts without expanding warehouse space or impairing productivity

Approach

Customize slots to unique traits of major part types:

- Small and binnable
- Bulky
- Able to nest

Result

Greater cube utilization

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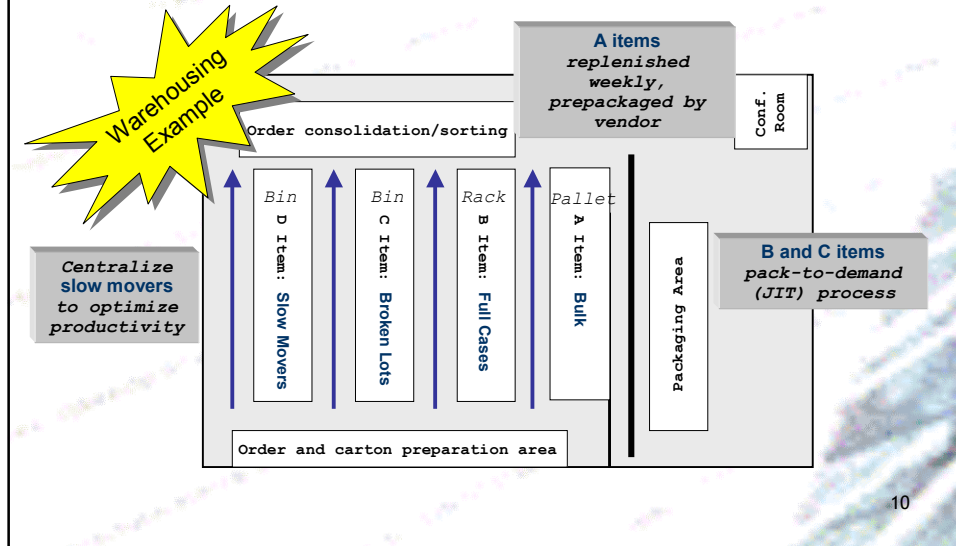
Achieve Higher Storage Density by Customizing Storage Slots

Warehousing Example



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Set Warehouse Pick Areas by Product Trait for Labor Efficiency



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Hewlett Packard

Challenge

Slow the proliferation of items

Approach

Calculate "complexity costs" of proposed SKUs: require threshold profitability

Result

Slower proliferation, more profitable new products

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Chemical Manufacturer

Challenge

Increase inventory turns

Approach

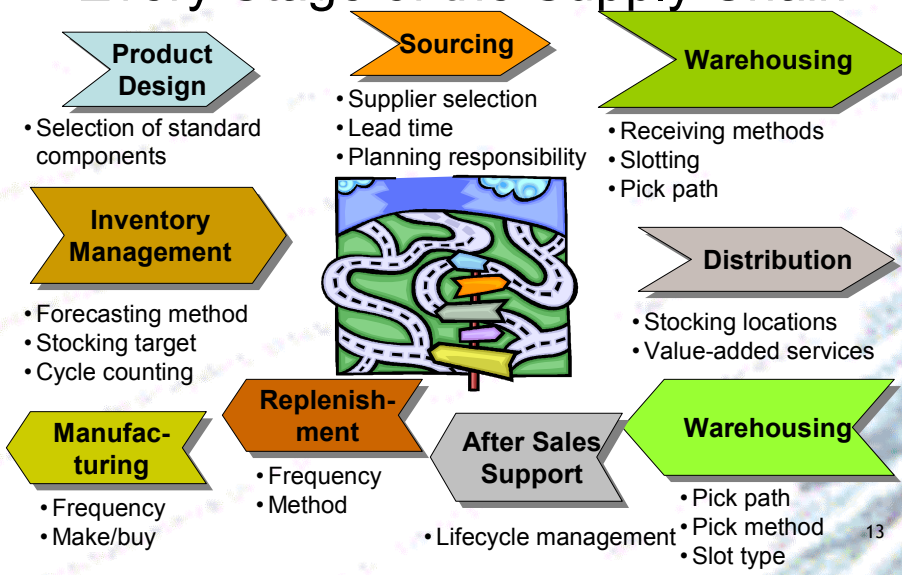
Group items according to impact and unique characteristics

Result

Shorten lead time and increase turns for high value items sourced overseas

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Diversity Can Be Managed at Every Stage of the Supply Chain



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There Are Three Ways to Deal With Product Diversity

- Ignore it?
- Deal with it.
- Fight it!

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Ways to Deal with Diversity: Option 2 - Deal With It!

- Identify areas where managing by averages may be misleading your team
- Respect the unique characteristics of items
 - ABC classification
 - Pareto prioritization
- Create a Parts Roadmap database

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Maintain a Database of Part Roadmap Information

DATA ITEM	DESCRIPTION
Part #	Number used to identify the material in the facility
Description	Material name (e.g., frame, bolt, nut, yoke)
Daily Usage	Maximum amount of material used in a day through the entire facility
Usage Location	Process/areas where the material is used (e.g., Cell 14)
Storage Location	Address (location) where the material is stored
Order Frequency	Frequency that the material is ordered from the supplier (e.g., daily, weekly, etc.)
Supplier	Name of the material supplier
Container Type	Packaging type of the container (e.g., cardboard box, reusable tote, wire basket)
Container Weight	Weight of an empty container
Total Package Weight	Weight of a full container of material
Container Length	Length or depth of the container
Container Width	Width of the container
Container Height	Height of the container
Shipment Size	Size of a standard shipment in days (1 week shipment = 5 days)
Carrier	Company providing parts-transportation services
Transit Time	Travel time required from the supplier to the facility (in days)

Source: Adapted from: Making Materials Flow Workbook, Lean Enterprise Institute, www.lean.org

Ways to Deal with Diversity: Option 3 - Fight it!

- Standardize
- Prune the product line
- Create a gate keeping process
 - Calculate impacts of additions and requiring justification