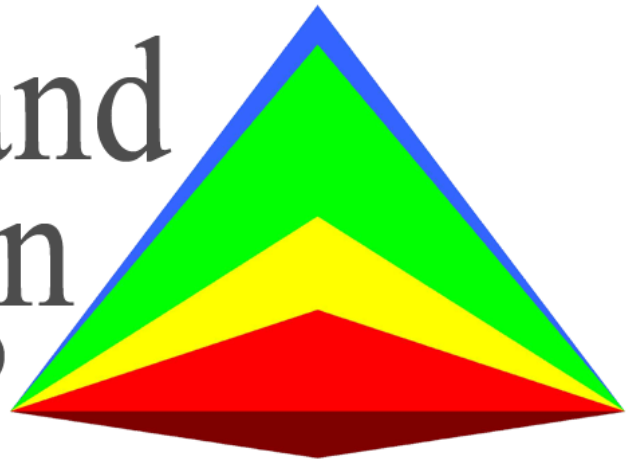
Demand Driven MRP



A Short Introduction

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What is the Problem we are Solving?



Today's formal planning systems are fundamentally broken!

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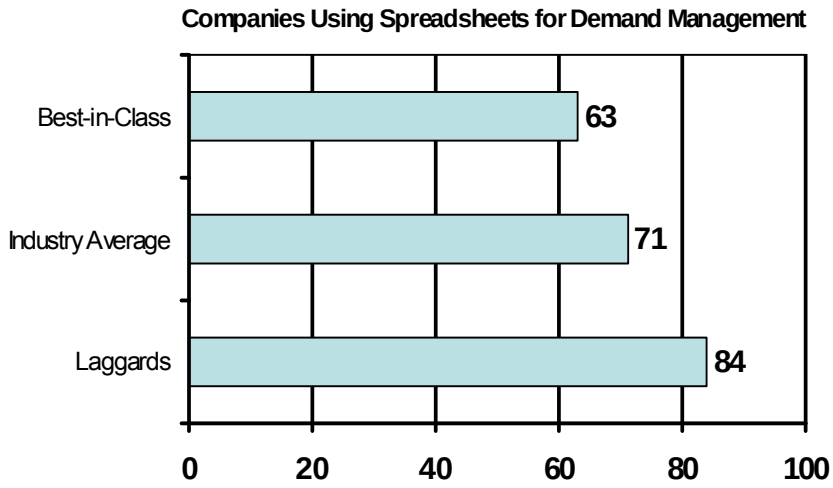
Modern Planning Systems Broken?!

NETSUITE

EPICOR



Aberdeen Group



Aberdeen Group (Demand Management, November, 2009)

"86% of respondents indicate that their management team has asked them to find opportunities to improve their companies supply chain planning processes and 71% of respondents have indicated the same for supply chain technology improvement."

Aberdeen Group (Inventory Optimization Technology Strategies for the Chief Supply Chain Officer, December 2010)

MADE2MANAGE

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Old Rules, Old Tools, New Pressures

- Forecast error is on the rise
- Volatility in supply and demand is increasing
- Legacy planning tactics and tools are breaking down
  - Inside most modern ERP systems is MRP
  - 79% of ERP Buyers implement MRP
  - Conceived in the 1950's
  - Codified in the 1960's
  - Commercialized in the 1970's and…
  - …it hasn't changed
  - What has changed?

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The "New Normal"

- Global sourcing and demand
- Shorter product life cycles
- Shorter customer tolerance times
- More product complexity and/or customization
- Pressure for leaner inventories
- Inaccurate forecasts
- More product variety
- Long lead time parts/components

Worldwide there are more complex planning and supply scenarios than ever – the past is NOT an predictor for the future

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Circumstance	1965	2013
Supply Chain Complexity	Low. Supply chains looked like chains – they were more linear. Vertically integrated and domestic supply chains dominated the landscape	High. Supply chains look more like "supply webs" and are fragmented and extended across the globe.
Product Life Cycles	Long. Often measured in years and or decades (e.g. rotary phones)	Short. Often measured in months (particularly in technology)
Customer Tolerance Times	Long. Often measured in weeks and months	Short. Often measured in days with many situations dictating less than 24 hour turns
Product Complexity	Low.	High. Most products now have relatively complex mechanical and electrical systems and micro-systems. Can you even work on a modern car anymore?
Product Customization	Low. Few options or custom feature available.	High. Lots of configuration and customization to a particular customer or customer type.
Product Variety	Low. Example – toothpaste. In 1965 Colgate and Crest each made one type of toothpaste.	High – in 2012 Colgate made 17 types of toothpaste and Crest made 42!
Long Lead Time Parts	Few. Here the word "long" is in relation to the time the market is willing to wait. By default if customer tolerance times were longer it stands to reason that there were less long lead time parts. More so, however, is that fact that supply chains looked different. Most parts were domestically sourced and thus often much "closer" in time.	Many. Today's extended and fragmented supply chains have resulted in not only more purchased items but more purchased items coming from more remote locations.
Forecast Accuracy	High. With less variety, longer life cycles and high customer tolerance times forecast accuracy was almost a non-issue. "If you build it, they will buy it."	Low. The combined complexity of the above items is making the idea of improving forecast accuracy a losing battle.
Pressure for Leaner Inventories	Low. With less variety and longer cycles the penalties of building inventory positions was minimized.	High. At the same time operations is asked to support a much more complex demand and supply scenario (as defined above) they are required to do so with less working capital!
Transactional Friction	High. Finding suppliers and customers took exhaustive and expensive efforts. Choices were limited. People's first experience with a manufacturer was often through a sales person sitting in front of them.	Low. Information is readily available at the click of the mouse. Choices are almost overwhelming. People's first experience with a manufacturer is often through a screen sitting in front of them.

From Demand Driven Performance – Using Smart Metrics (Debra Smith and Chad Smith, McGraw-Hill, 2013)

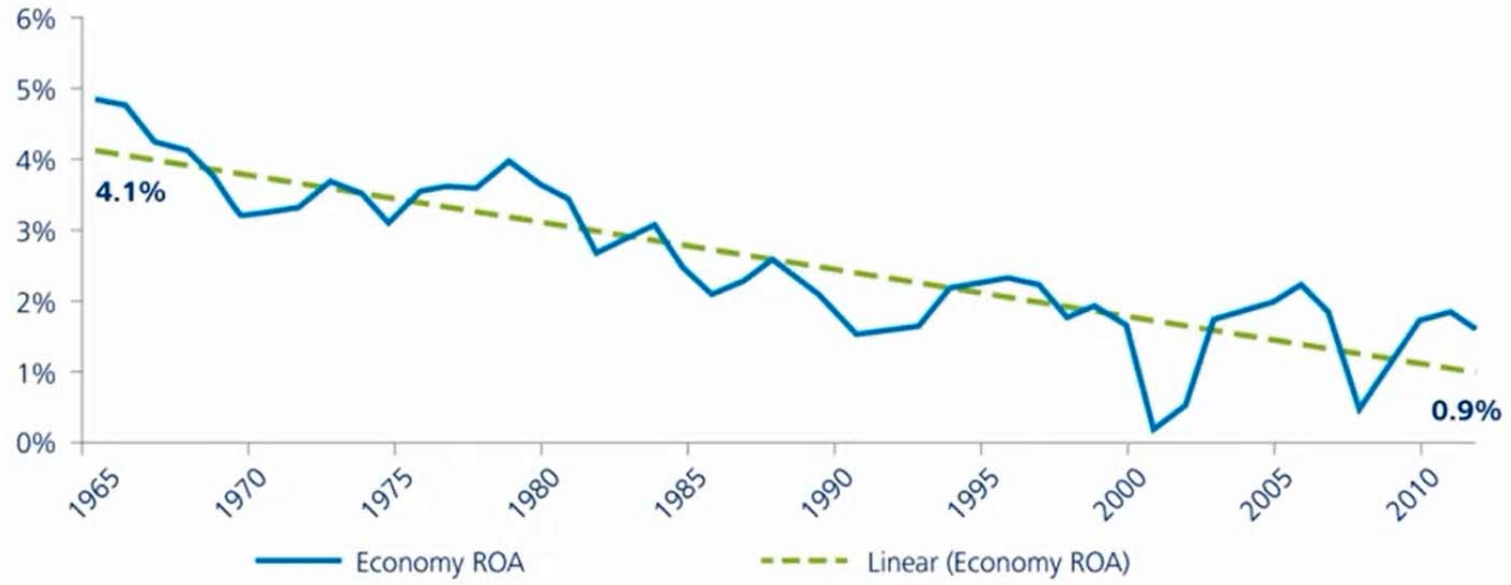
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We Must Find Another Way to Operate

Business Reality – Return on Asset Decrease

Figure 1. Return on assets for the US economy (1965–2012)



US firms' ROA fell to a quarter of its 1965 levels in 2012. To increase, or even maintain, asset profitability, firms must find new ways to create value from their assets.

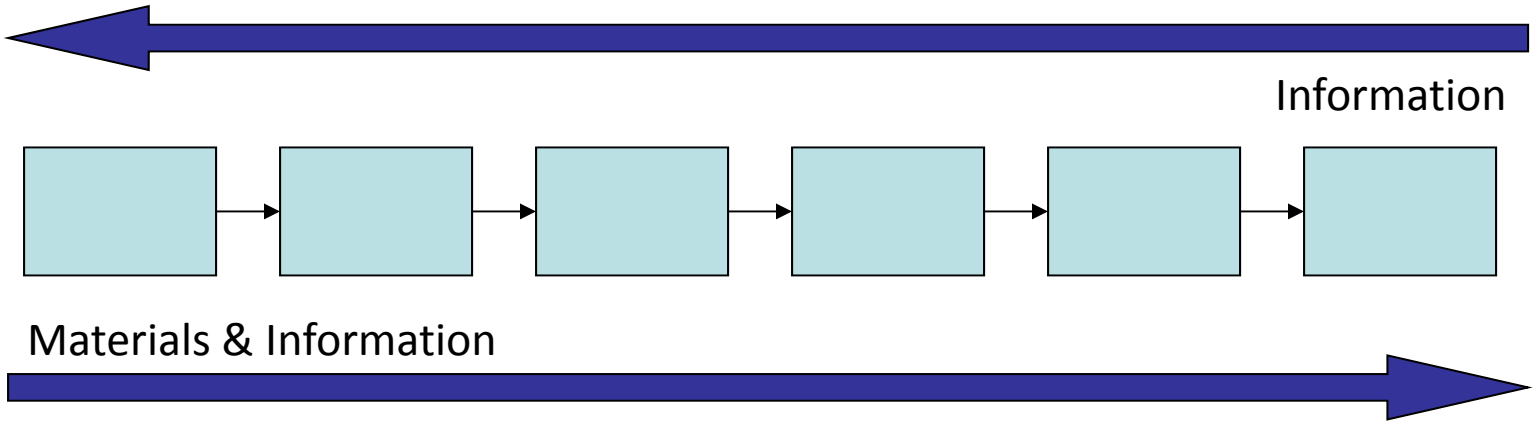
Deloitte University Press DUPress.com

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The First Law of Manufacturing

All benefits will be directly related to the speed of **FLOW** of materials and information.



Corollary:
Materials and Information must be RELEVANT!!!

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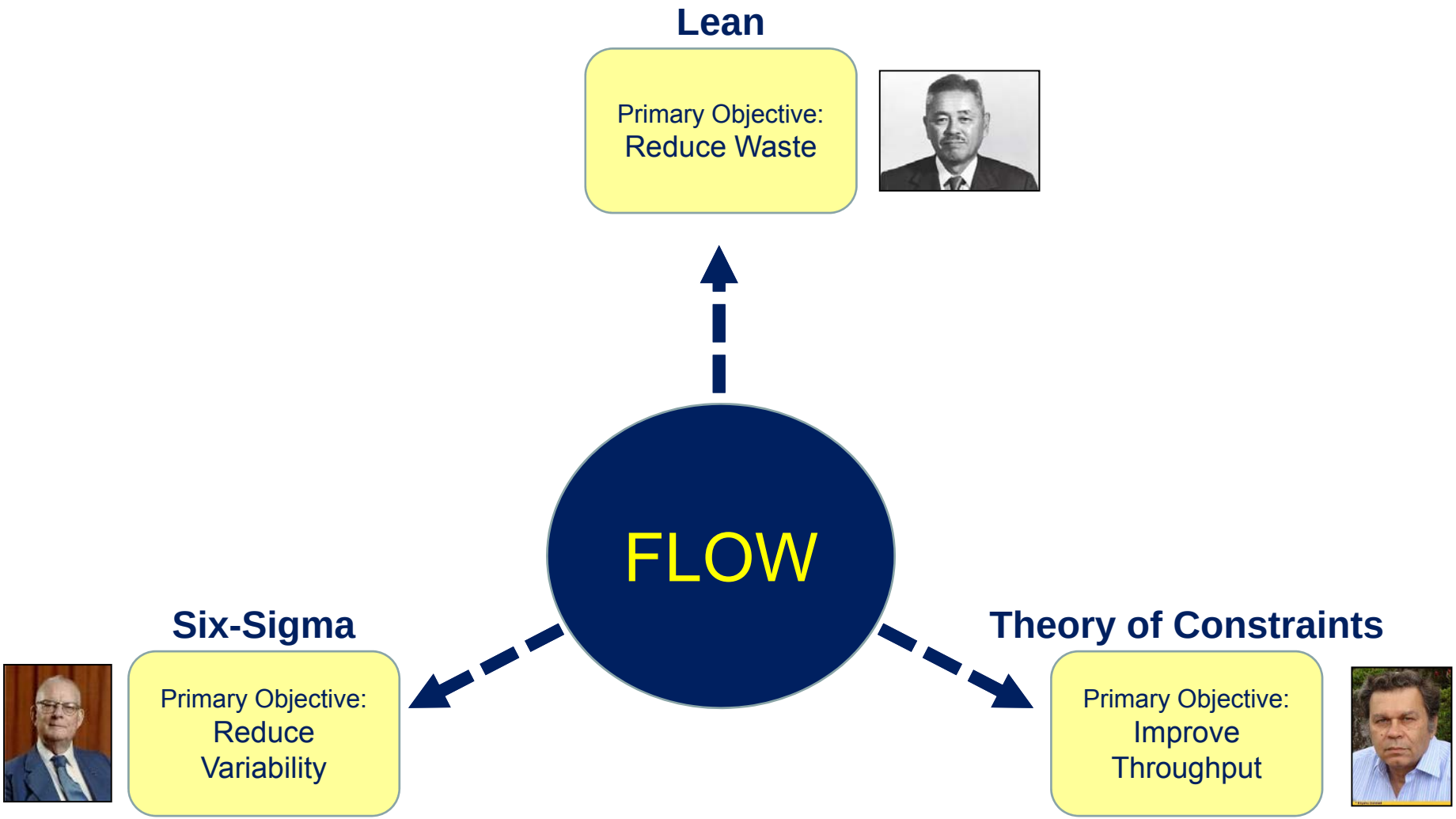
Flow is the enabler for the primary objectives of most companies



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Flow is the intersection of
prevailing improvement methods



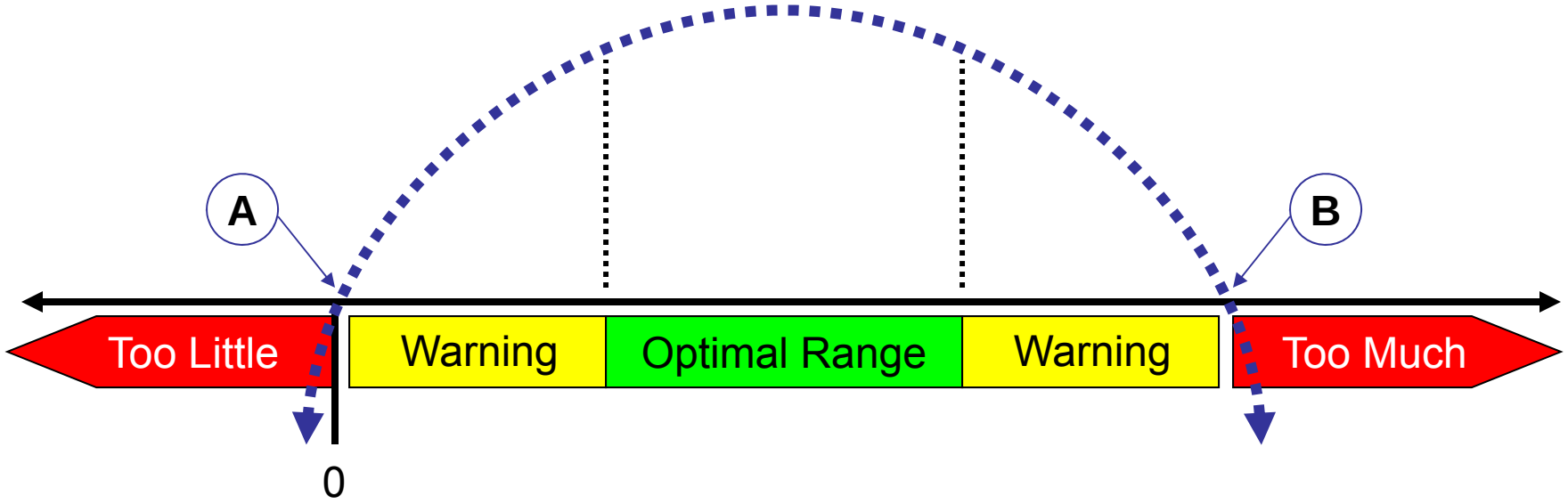
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The Challenge to Flow

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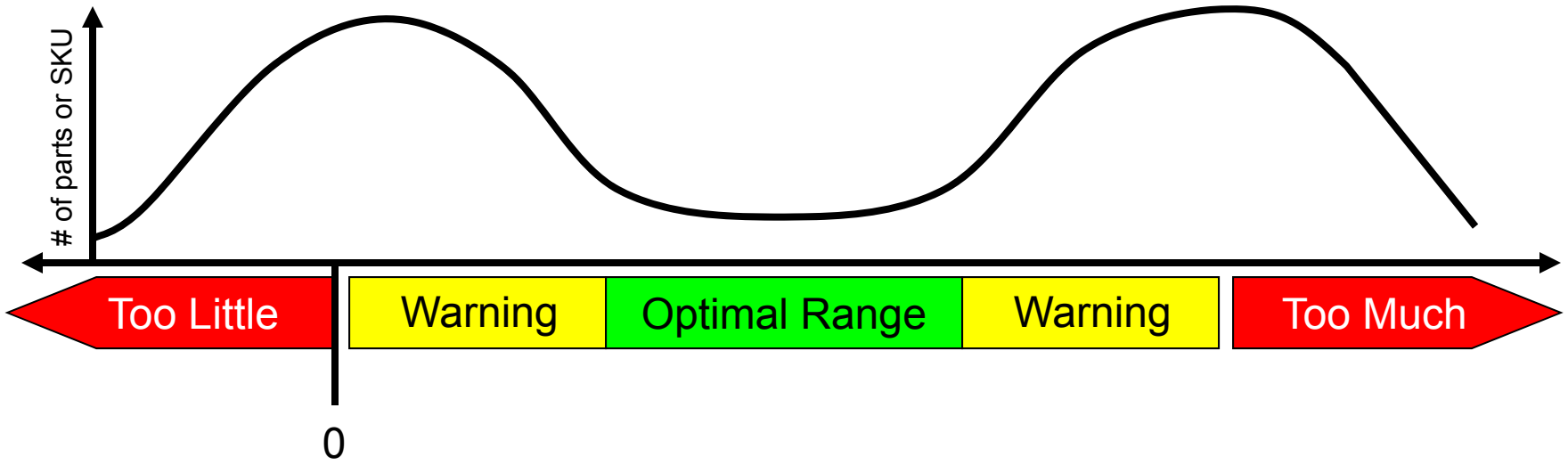
Two Universal Point of Inventory



Note: “Optimal” is from an on-hand perspective

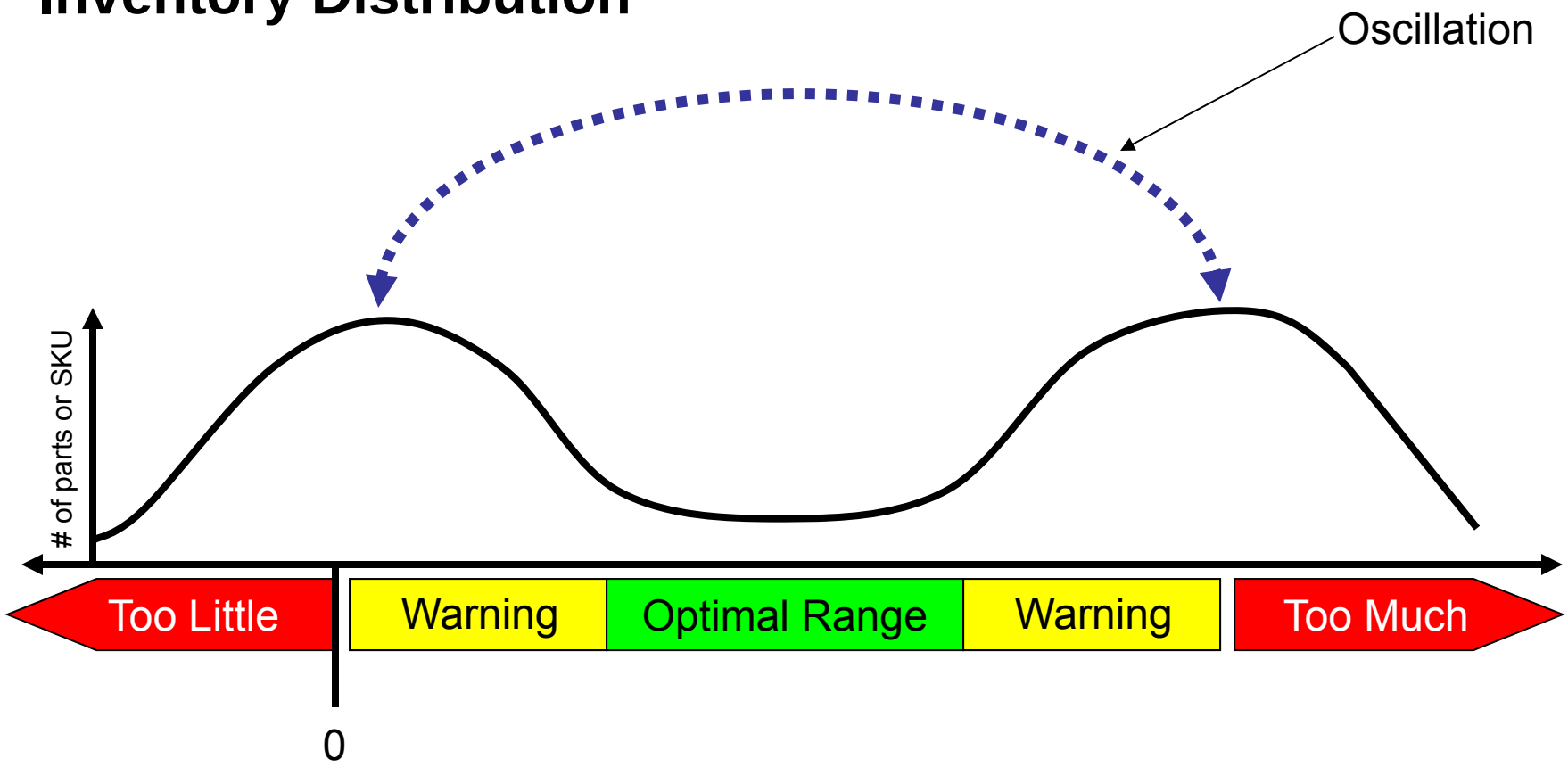
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The MRP “Bi-Modal” Distribution



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Virtually All Supply Chains Suffer from the "Bi-Modal" Inventory Distribution



Three Simultaneous Effects:

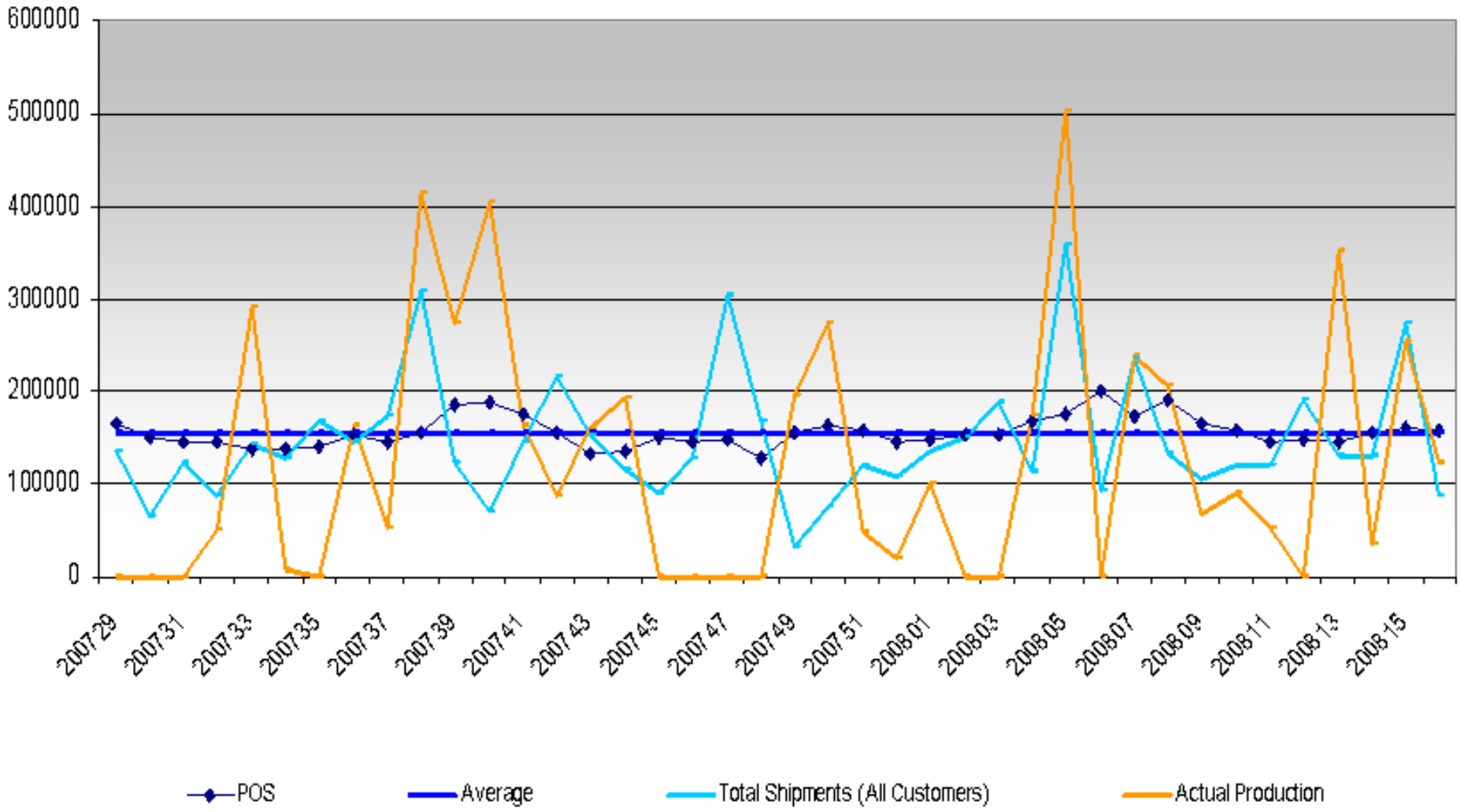
1. Persistently High Inventories
2. Chronic and Frequent Shortages
3. High Expedite and Waste Related Expenses

"How can we have so much inventory and not be able to ship orders?!"
"We paid for fast freight now we don't need it?!"

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Bullwhip Example

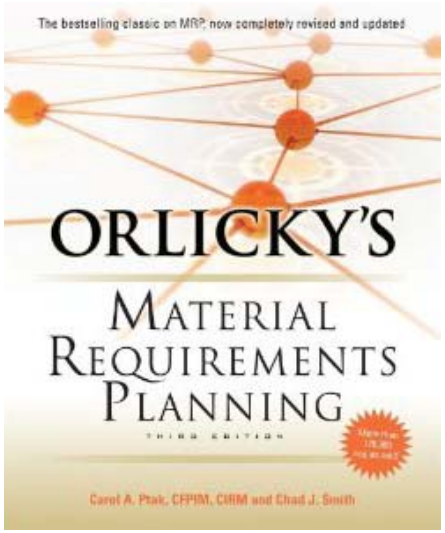


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What is Demand Driven MRP?

A multi-echelon materials and inventory planning and execution solution.



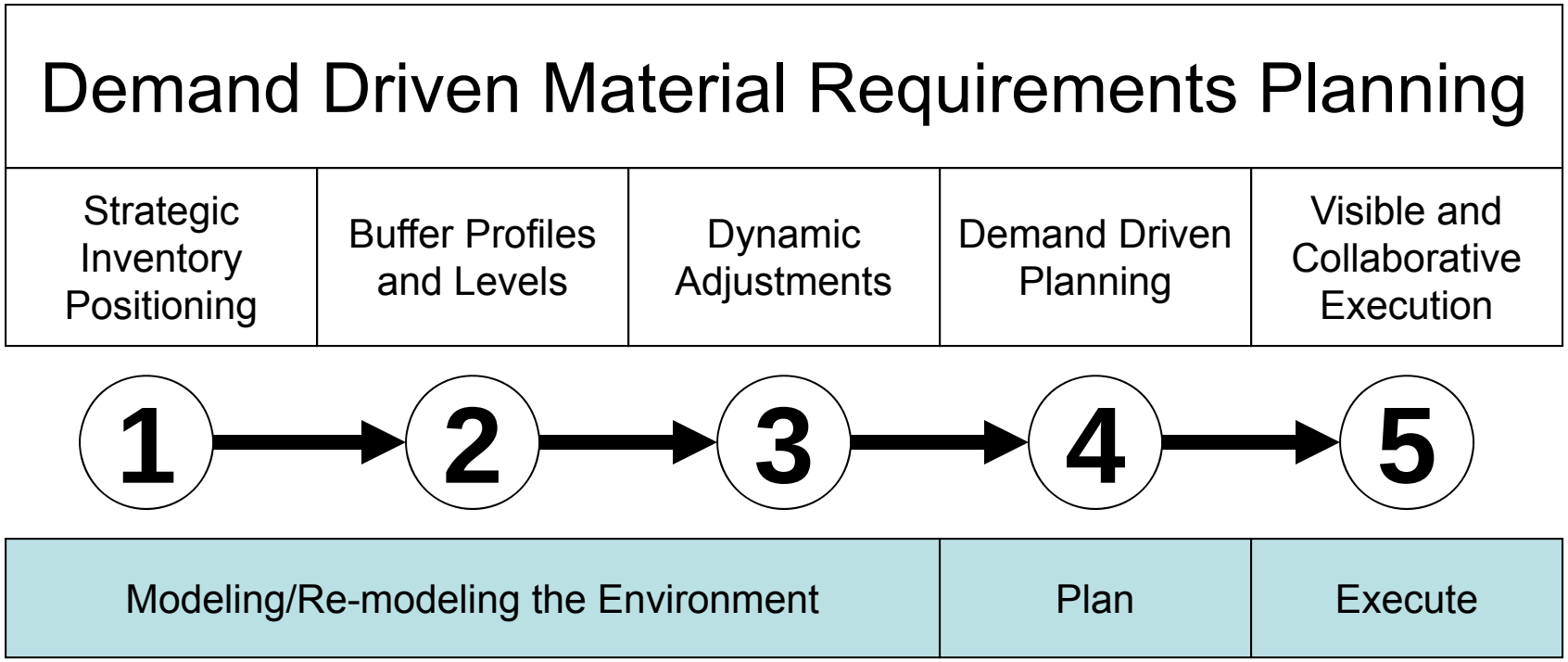
Demand Driven MRP (DDMRP)

- Material Requirements Planning (MRP)
- Distribution Requirements Planning (DRP)
- Lean
- Theory of Constraints
- Six Sigma
- Innovation

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The Five Components of DDMRP



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Component 1: Positioning

Demand Driven Material Requirements Planning				
Strategic Inventory Positioning	Buffer Profiles and Levels	Dynamic Adjustments	Demand Driven Planning	Visible and Collaborative Execution

Where?

(Position)

BEFORE

How Much?

(Quantity)

When?

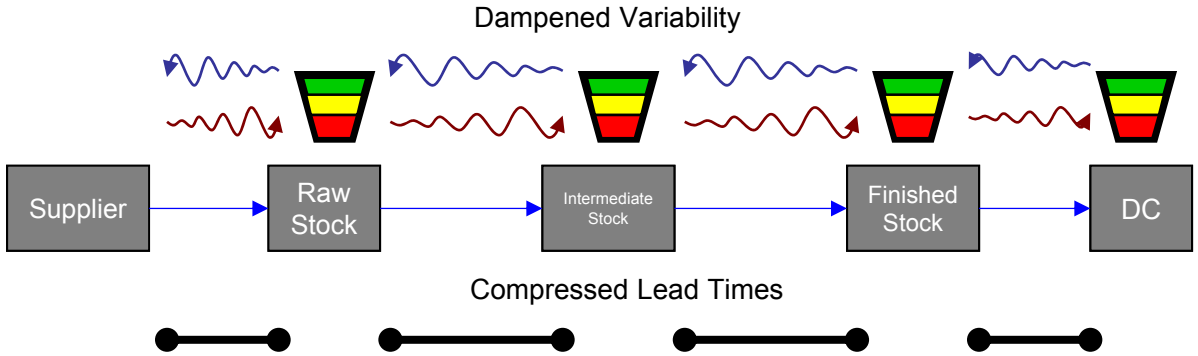
(Timing)

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Component 1: Positioning

Demand Driven Material Requirements Planning				
Strategic Inventory Positioning	Buffer Profiles and Levels	Dynamic Adjustments	Demand Driven Planning	Visible and Collaborative Execution

Strategically places decoupling points within the product structure and supply chain to absorb variability and compress lead times



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Component 1: Positioning

Demand Driven Material Requirements Planning				
Strategic Inventory Positioning	Buffer Profiles and Levels	Dynamic Adjustments	Demand Driven Planning	Visible and Collaborative Execution

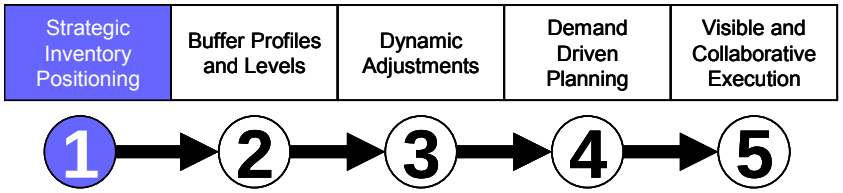
6 Factors

1. Customer Tolerance Time
2. Market Potential Lead Time
3. Supply and Demand Variability
4. Inventory Flexibility and Matrix BOM
5. Supply and Distribution Net Structure
6. Critical Resource Considerations

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Failure to properly position inventory is a huge source of waste for most manufacturing and supply chain companies.

Position and Pull



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Component 2: Buffer Profiles and Levels

Demand Driven Material Requirements Planning				
Strategic Inventory Positioning	**Buffer Profiles and Levels**	Dynamic Adjustments	Demand Driven Planning	Visible and Collaborative Execution

Group Trait Inputs	+	Individual Part/SKU Inputs
Lead Time Category Make, Buy or Distributed Variability Category Significant Order Multiples		Average Daily Usage Appropriate Discrete Lead Time Ordering Policy (min, max, multiple) Location (distributed parts)

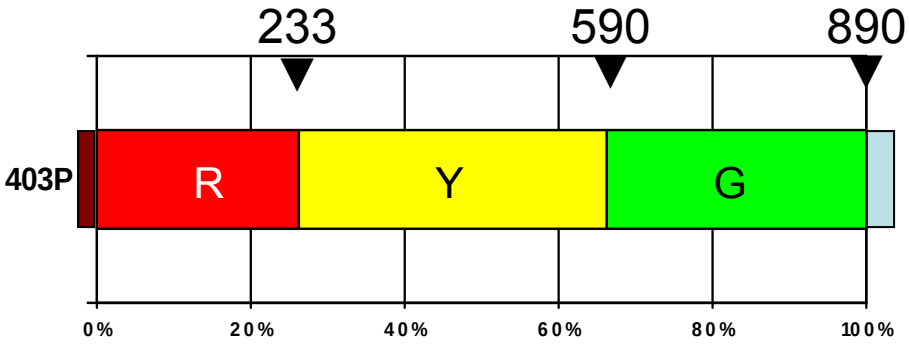
Stock Out	ALERT!	Rebuild	OK	Too Much

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Component 2: Buffer Profiles and Levels

Demand Driven Material Requirements Planning				
Strategic Inventory Positioning	**Buffer Profiles and Levels**	Dynamic Adjustments	Demand Driven Planning	Visible and Collaborative Execution

Part: 403P Lead Time: 21 days	Buffer Profile: B11MOQ
Green Zone	**300**
Yellow Zone	**357**
Red Zone Base	**179**
Red Zone Safety	**54**

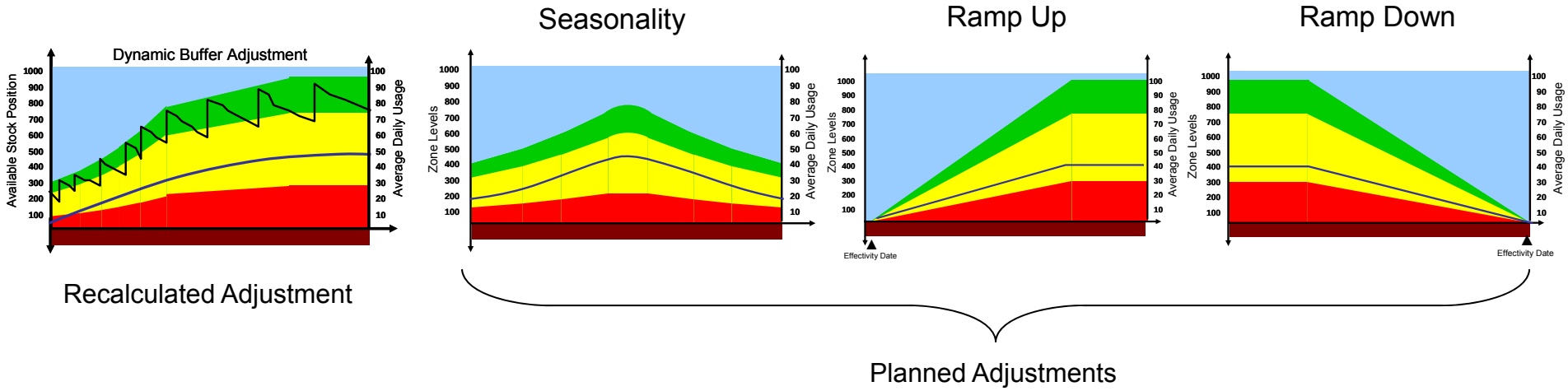


For more on buffer sizing see the white paper DDMRP Buffer Explanation and Simulation

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Component 3: Dynamic Adjustments

Demand Driven Material Requirements Planning				
Strategic Inventory Positioning	Buffer Profiles and Levels	**Dynamic Adjustments**	Demand Driven Planning	Visible and Collaborative Execution



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Component 4: Demand Driven Planning

Demand Driven Material Requirements Planning				
Strategic Inventory Positioning	Buffer Profiles and Levels	Dynamic Adjustments	**Demand Driven Planning**	Visible and Collaborative Execution

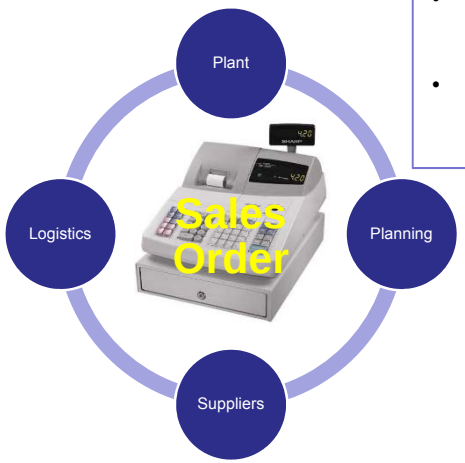
Shifts to a Sales Order driven planning method

- Planned orders create supply orders in anticipation of need
- Forecast error associated with Planned orders results in inventory misalignments and expedite expenses

From:



To:



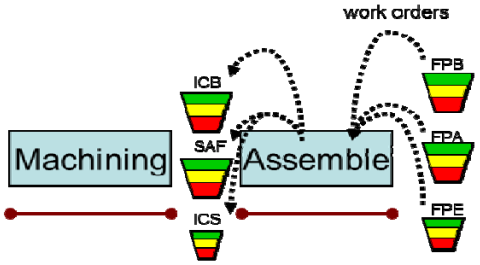
- Only qualified sales orders within a short range horizon qualify as demand allocations
- Sales orders give a near perfect demand signal in terms of what will be sold and when it will be sold.

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Component 4: Demand Driven Planning

Demand Driven Material Requirements Planning				
Strategic Inventory Positioning	Buffer Profiles and Levels	Dynamic Adjustments	**Demand Driven Planning**	Visible and Collaborative Execution



Part	Open Supply	On-hand	Demand	Available Stock	Recommended Supply Qty	Action
FPB	5453	4012	3200	6265 (60%)	6500	Create Work Order
FPE	3358	4054	540	6872 (66%)	3128	Create Work Order
FPA	530	3721	213	4038 (67%)	2162	Create Work Order

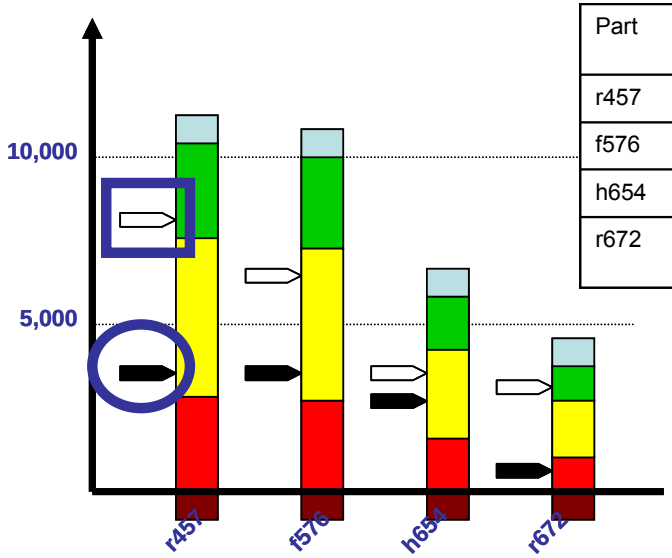
DDMRP creates resupply signals based on the “available stock” status of each buffer. This gives prioritized sequence based on actual need.

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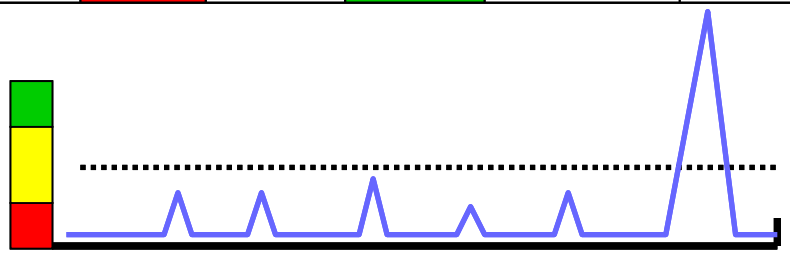
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Component 4: Demand Driven Planning

Demand Driven Material Requirements Planning				
Strategic Inventory Positioning	Buffer Profiles and Levels	Dynamic Adjustments	**Demand Driven Planning**	Visible and Collaborative Execution



Part	Open Supply	On-hand	Demand	Available Stock	Recommended Supply Qty	Action
r457	5453	4012	1200	8265	0	No Action
f576	3358	[illegible]	540	[illegible]	3128	Place New Order
h654	530	3721	213	4038	2162	Place New Order
r672	2743	1732	623	3852	0	Expedite Open Supply (Execution)



Order Spike Horizon

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Component 5: Execution

Demand Driven Material Requirements Planning				
Strategic Inventory Positioning	Buffer Profiles and Levels	Dynamic Adjustments	Demand Driven Planning	Visible and Collaborative Execution

Order #	Order Type	Due Date	Customer
MO 12367	Stock	5/12/2011	Internal
MO 12379	MTO	5/12/2011	Super Tech
MO 12465	Stock	5/12/2011	Internal
MO 12401	Stock	5/14/2011	Internal
MO 12411	Stock	5/16/2011	Internal

Problem: Priority by DUE DATE

Order #	OH Buffer Status	Order Type	Due Date	Customer
MO 12379		MTO	5/12/2011	Super Tech
MO 12401	12% (RED)	Stock	5/14/2011	Internal
MO 12465	27% (RED)	Stock	5/12/2011	Internal
MO 12367	33% (YELLOW)	Stock	5/12/2011	Internal
MO 12411	41% (YELLOW)	Stock	5/16/2011	Internal

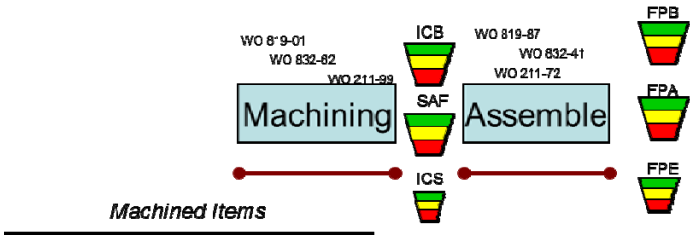
Solution: Priority by BUFFER STATUS!

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Component 5: Execution

Demand Driven Material Requirements Planning				
Strategic Inventory Positioning	Buffer Profiles and Levels	Dynamic Adjustments	Demand Driven Planning	Visible and Collaborative Execution

On-the-floor priority is then determined by the real time buffer status of the decoupling points that the open orders are feeding.

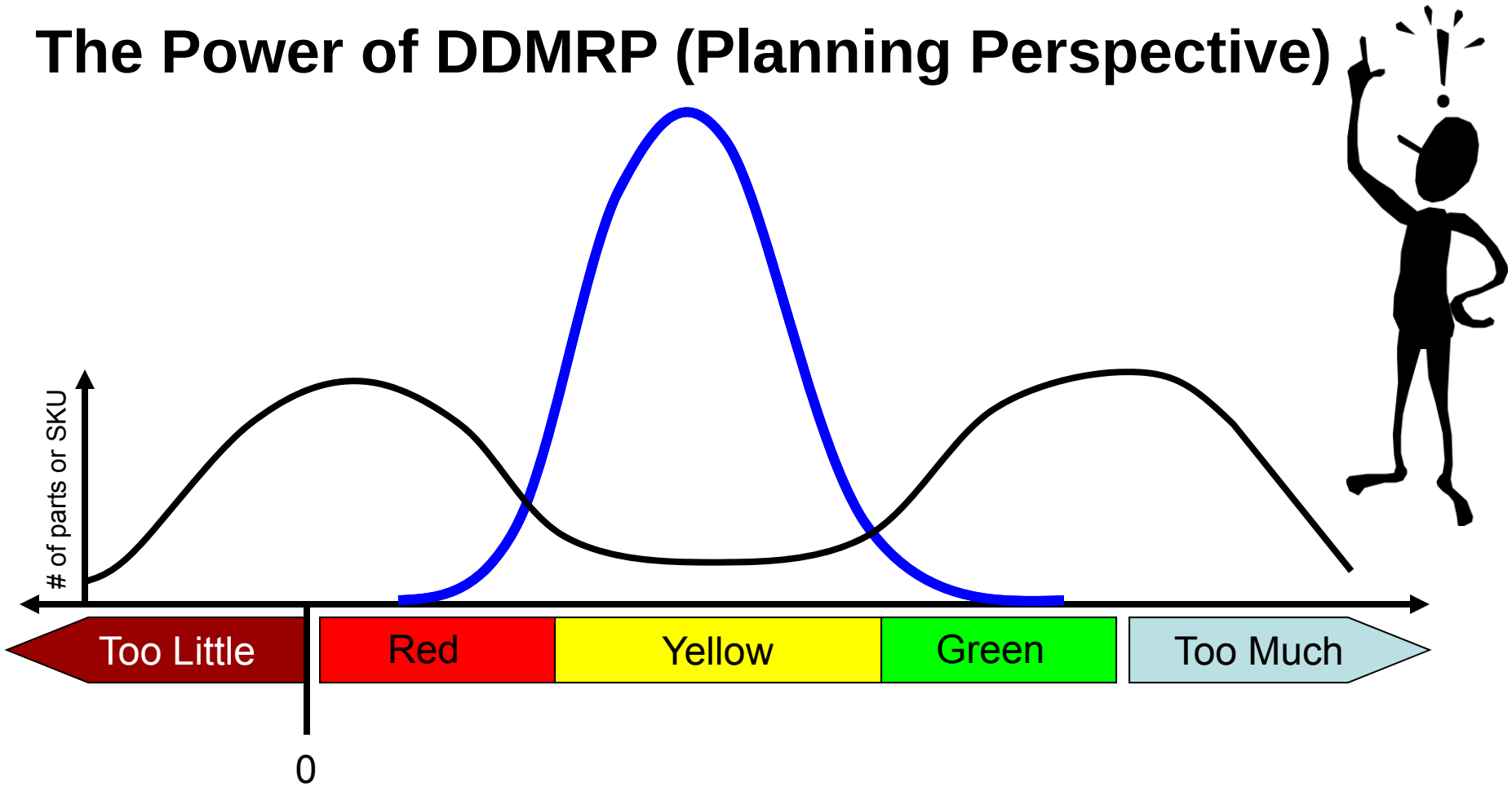


Machined Items

Order #	Due Date	Item #	Buffer Status
WO 819-01	05/24	ICS	Critical 20%
WO 832-62	05/22	SAF	Critical 35%
WO 211-99	05/22	ICB	Med 51%

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The Power of DDMRP (Planning Perspective)



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DDMRP Benefits

Benefit	Typical improvements
Improved Customer Service	Users consistently achieve 97-100% on time fill rate performance
Lead Time Compression	Lead time reductions in excess of 80% have been achieved in several industry segments
Right-sizes Inventory	Typical inventory reductions of 30-45% are achieved while improving customer service Eliminates 'bi-modal' inventory distribution – "Too much of the wrong – too little of the right"
Lowest total supply chain cost	Costs related to expedite activity and false signals are largely eliminated (fast freight, partial ships, cross-ships, schedule break-ins)
Easy and Intuitive	Planners see priorities instead of constantly fighting the conflicting messages of MRP

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Breakthrough Achievements by DDMRP Adopters

World Class FMCG

•Achieved 99.7% customer service
•Reduced raw and pack materials by 18%
•Compressed lead time by 82%
•Reduced Finished Goods inventory by 45%

Unilever

Large Oil and Mining Equipment

•Achieved 400+% revenue growth with only 85% inventory growth
•Reduced lead times from 18 months to 18 weeks
•Customer service improved to 95%

LeTourneau TECHNOLOGIES™
Built On Experience. Driven By Vision.

Packaged Foods

•Grew revenue by 13x with only 2.5x growth in inventory
•Dramatic improvement in customer service
•Improved operations stability

OREGON FREEZE DRY

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Where to Find out More?

- Online:
  - www.demanddrivenmrp.com (free downloads and podcasts)
  - www.demanddrivenworld.com (free downloads of company presentations from the Demand Driven World Conference)
  - Official DDMRP LinkedIn group: 

  - Free Webinars (This Thursday and Friday)
- Books:
  - Orlicky's Material Requirements Planning 3/E (Ptak and Smith, McGraw-Hill, 2011) Chapters 1-4, 22-29
  - Demand Driven Performance – Using Smart Metrics (Smith and Smith, McGraw-Hill, 2013)
- Earn Your Certified Demand Driven Planner (CDDP) certificate

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Certified Demand Driven Planner Program

May 14-16, 2014

Instructor: Carol Ptak

Springhill Suites Chicago/O'Hare
8101 Higgins Rd.
Chicago, IL 60631

Registration Link



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