highimpact
coaching & strategies

DEMAND DRIVEN MATERIAL REQUIREMENTS PLANNING:

The Next Generation MRP Standard

MRP AND COMPLEXITY

Orlicky's first edition MRP (1975) highlighted a need to overhaul how a business plans and manages both inventory and resource. By the year 1990 over 1 million companies were using MRP with little change from its original concept.

Industry is now presented a new dilemma as the circumstances that drove Orlicky's original design have dramatically changed.

Year	Complexity	Customer Tolerance	Long Lead Time Parts	Forecast Accuracy	Product Life Cycle	Product Variety	Higher Inventory Turns
1975	LOW	Long (Months)	Few	High	Long (Years / Decades)	Low	No Concern
2016	HIGH	Short (Days)	Many	Low (Falling)	Short (Months / Years)	High	Business Priority

How Much Different is 2016 than 1975?

MRP's CURRENT IMPACT ON PERFORMANCE

#	If DEMAND is	And RESPONSE CYCLE is	then INVENTORY REQUIRED	
			WIP	FINISHED GOODS
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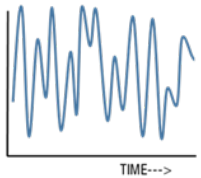
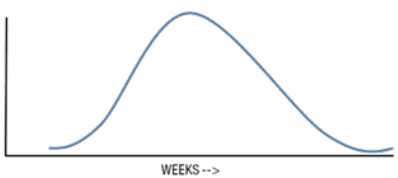
2				

- In 1975 MRP was designed around an environment that modeled Scenario 1 with low demand volatility and long manufacturing lead times.
- The reality of 2016 looks more like Scenario 2 with high demand volatility and still long manufacturing lead times.
- MRP no longer produces results that are aligned to the business objectives and key metrics.

EVOLUTION OF COMPLEXITY

1990s:

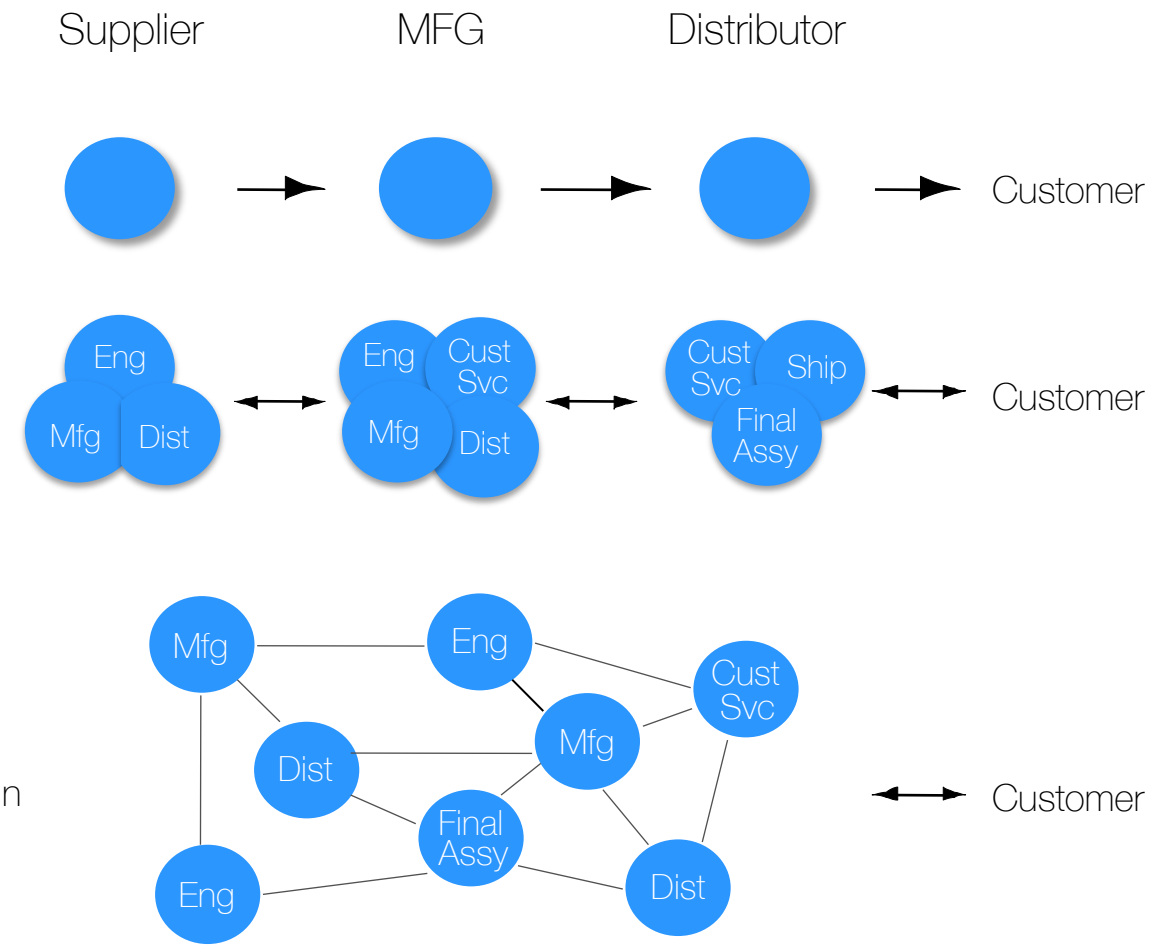
Serial flow across organizations.

2000s:

Concept of the Value Chain introduced
Internal processes begin to move outward.

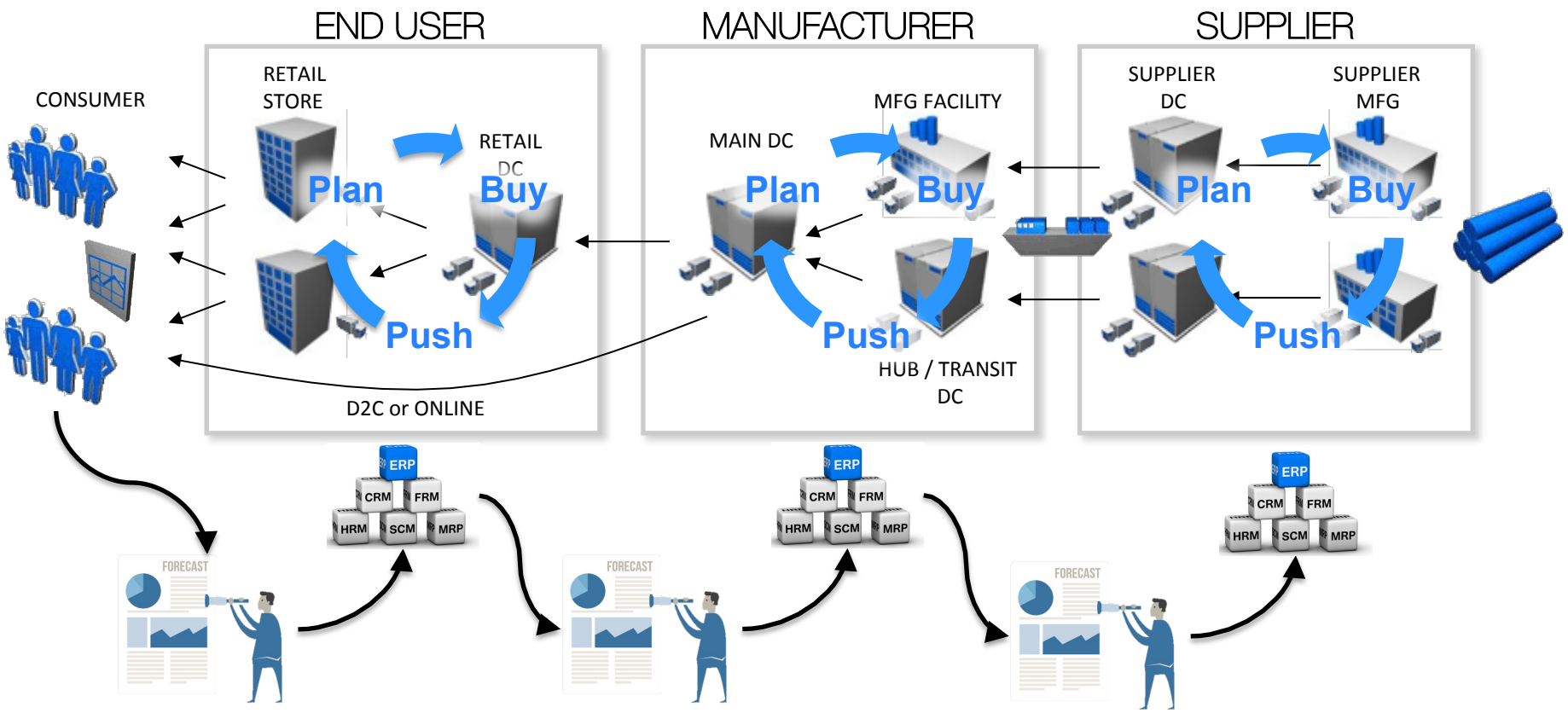
2007 to Present:

No longer a chain but now a **Supply Network** with dynamic relationships across all nodes in the Network.



TYPICAL COMPLEX ENVIRONMENT

Today's formal planning systems are fundamentally broken!



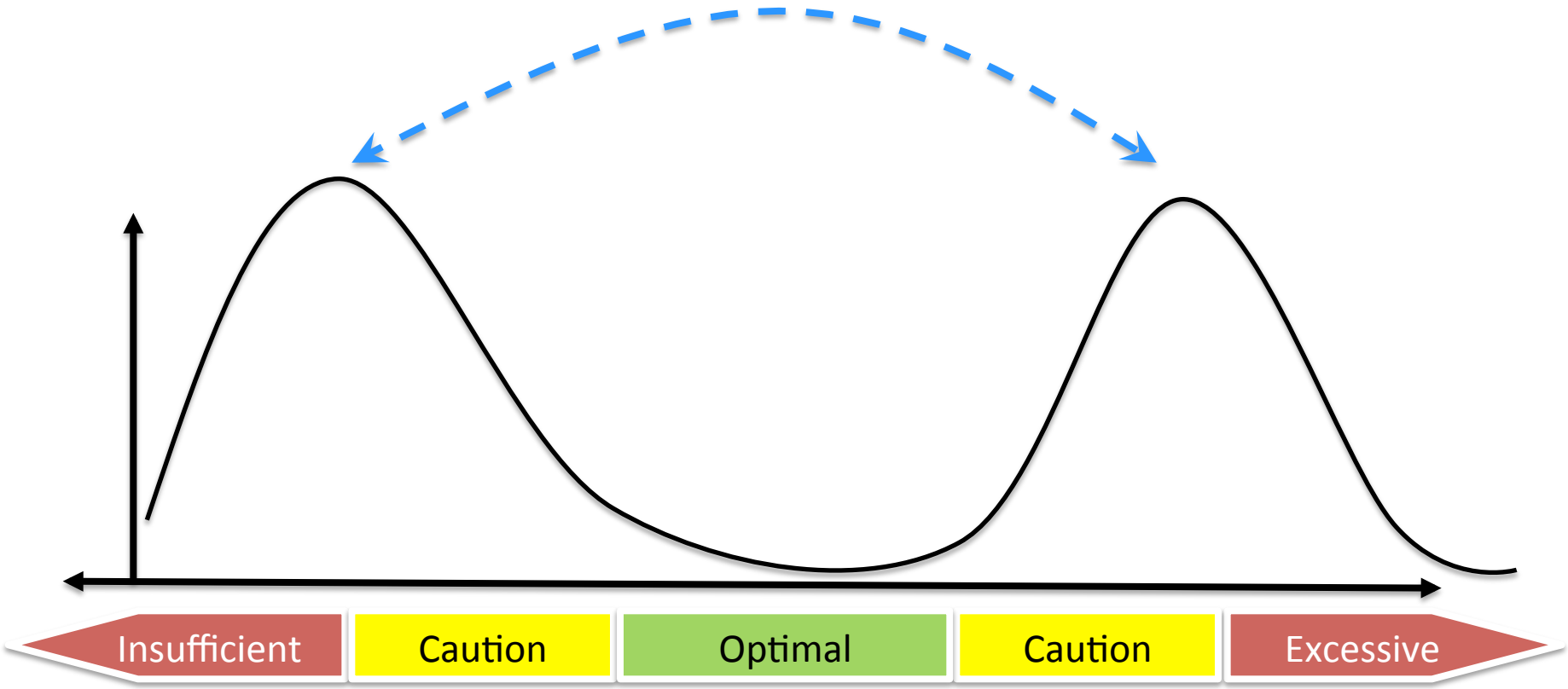
TWO PRIMARY DRIVERS OF ISSUES

- Today's MRP systems are still designed based on 1975 technology. However, the complexities of today's environment are completely different.

- Forecast accuracy is at a point of diminishing returns. We will never achieve 100% accurate!

World Class forecast accuracy has been identified as 75%. Reality is far less and difficult to improve.

MRP OSCILLATION



MRP Oscillates back and forth between insufficient and excessive inventory. This is largely driven by the traditional planning process.

ISSUES WITH MRP

- Demand is actual a combination of Forecast and Demand
- Too responsive to change with planning derived from a known inaccurate forecast
- Change generates requirements where some may be past due and many may not be real and/or impossible to meet
- Outmoded inventory management techniques
- Generates avalanche of exception messages many of which are erroneous and and others that are ignored
- Creates nervousness and instability within the Supply Network
- MRP Assumptions
  - Lead times are known
  - Full allocation
  - Order Independence

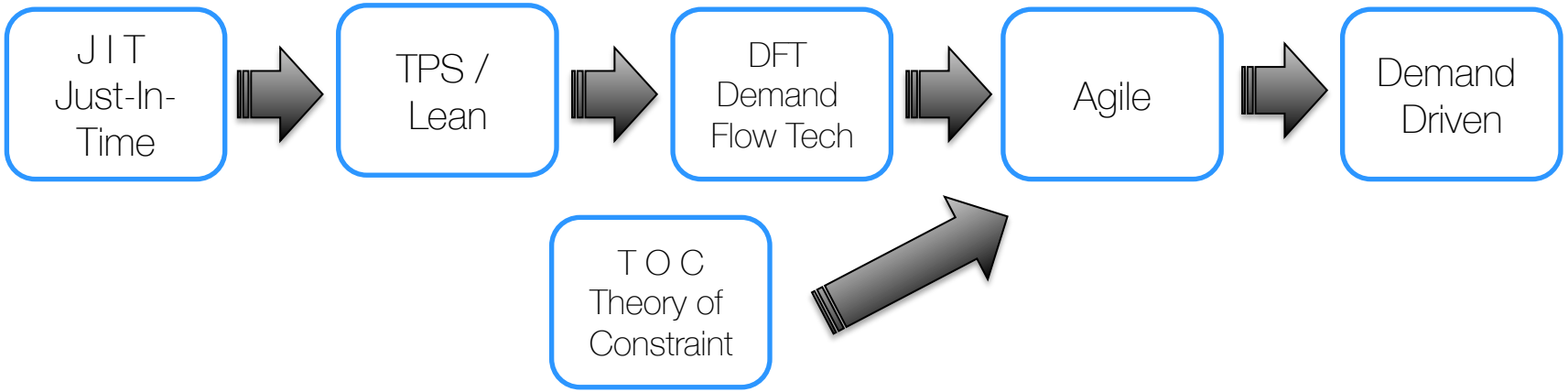
ISSUES WITH MRP

- Is an incomplete system without execution tools to manage the environment
- Additional amount of analytical work and manual effort required to obtain desired output
  - Reliance on Excel to plan and execute with the proliferation of manual workarounds
  - Users rely on complicated Excel documents; 90% of Excel documents contain errors of 1% or more of all formula cells [Wall Street Journal MarketWatch, April 20, 2013]

WHAT IS DEMAND DRIVEN

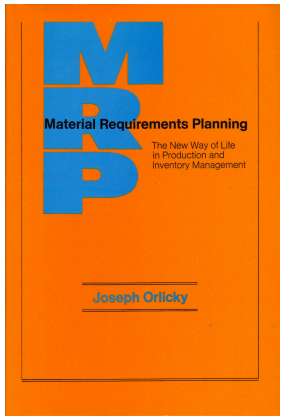
- What is Demand Driven
  - Sensing and shaping of customer demand, then adapting planning and production while pulling from suppliers all in real time. *[Demand Driven Institute 2009)*

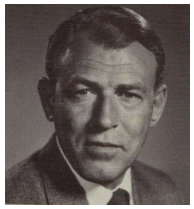
- Evolution of Demand Driven



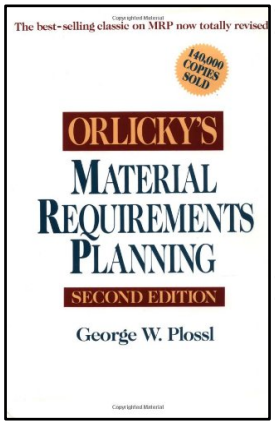
Moving from Push and Promote to Position and Pull

EVOLUTION OF MRP AS A STANDARD

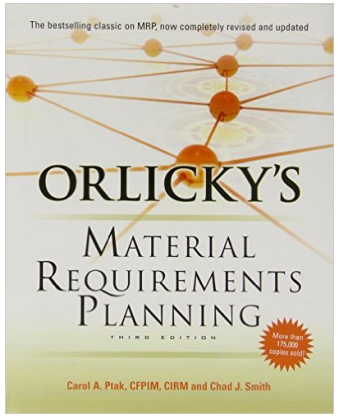




- 1975, McGraw-Hill published the 1st Edition of Joe Orlicky's Material Requirements Planning.
  - Detailed the procedures involved in an innovative computer-based approach to improving production planning & inventory control



- 1994, McGraw-Hill publish 2nd Edition by George Plossl
  - Original text updated to include post-MRP developments such as MRP II, JIT, and TQM
- 2011, McGraw-Hill publish 3rd Edition by Carol Ptak & Chad Smith
  - Introduces the next generation of MRP logic, Demand Driven MRP (DDMRP)
  - "The definitive reference for the next generation of manufacturing practitioners and leaders." From the Foreword by Dave Turbide, CFPIM, CMfgE, CIRM, CSCP



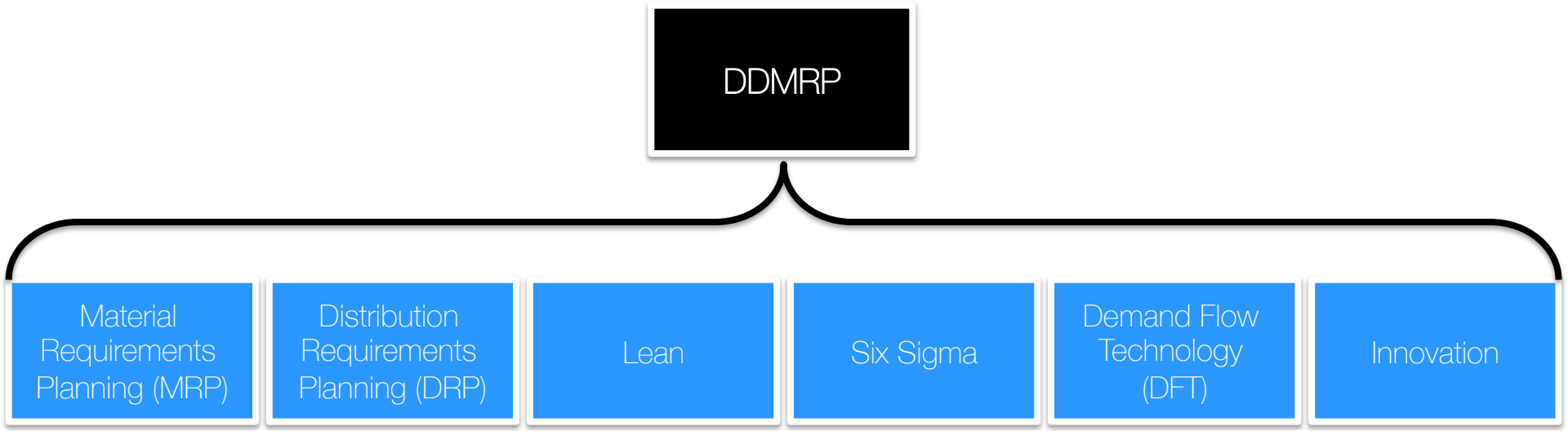
DEMAND DRIVEN INSTITUTE

- The Demand Driven Institute (DDI) is dedicated to proliferation of demand driven strategies and tactics in industry
- DDMRP is becoming the world standard for the emerging demand driven methodology in planning, scheduling and execution
- DDI was founded in 2011 by Carol Ptak and Chad Smith, co-authors of Orlicky's Material Requirements Planning, Third Revised Edition
  - Carol Ptak: Previously Vice President at PeopleSoft where Ms. Ptak developed the concept of demand driven manufacturing and Global Executive at IBM Corporation. Also past President of APICS
  - Chad Smith: Internationally recognized expert in the Theory of Constraints (TOC)

Demand Driven™ INSTITUTE

WHAT IS DDMRP

- What is Demand Driven Material Requirements Planning (DDMRP)
  - Multi-Echelon Material and Inventory Planning and Execution system that enables a company to become Demand Driven.



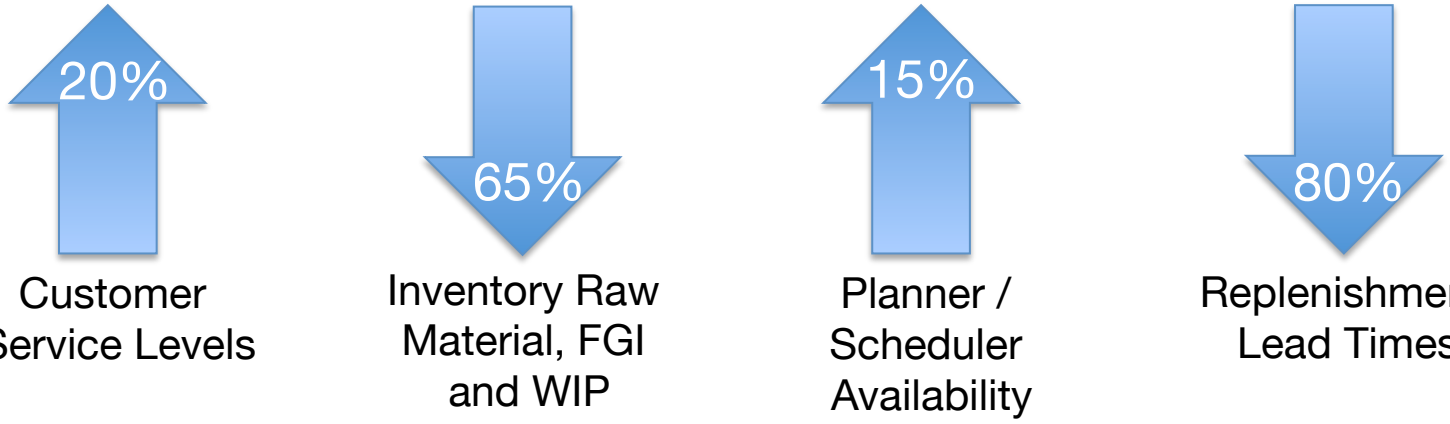
Using Forecast to plan, Demand to Produce and Procure

BENEFITS STORY FOR DDMRP

Top issues facing most Supply Chains

- Reduce costs while improving customer service levels
- Pressure to improve Inventory Turns
- Complexities with the Global Supply Network
- Growing lead times through the entire Supply Network

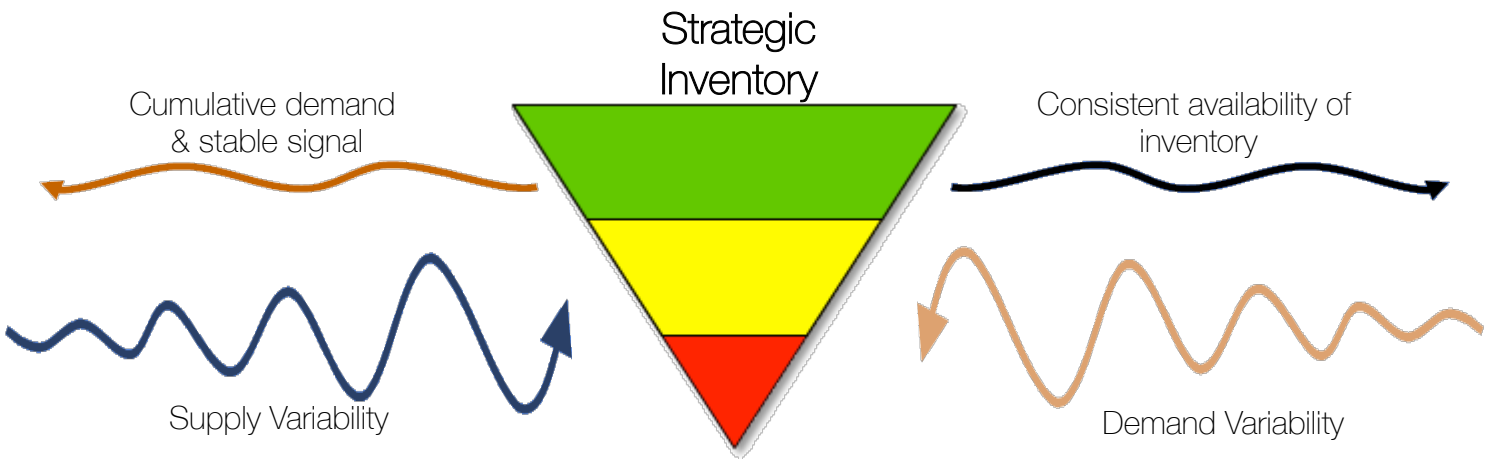
Benefits of DDMRP based on case studies by the Demand Driven Institute.



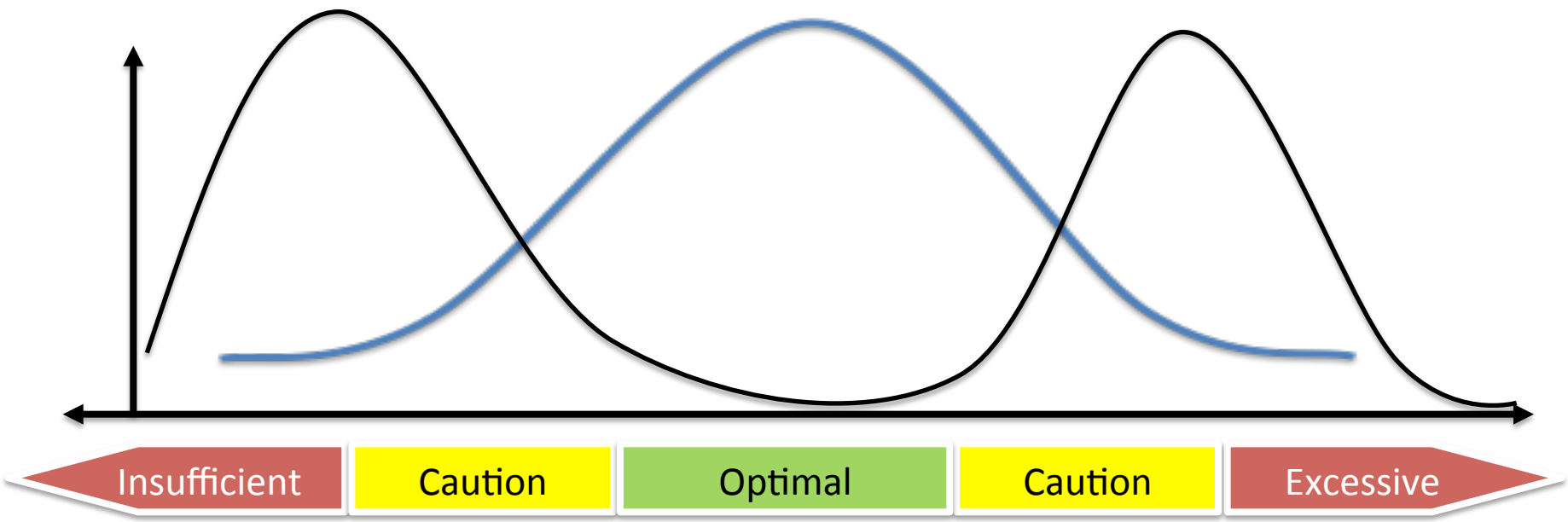
MINIMIZING THE ADVERSE IMPACT OF MRP

To minimize the system created nervousness of MRP through the Supply Network we need to stop passing variability between the consuming and producing companies within the system. The variation is the result of demand distortion and supply disruption through the entire Supply Network.

Demand Driven methodology recommends to Decouple MRP at strategic positions and then establish Strategic Inventory at these decoupled points enabling a positive ROCE.



DDMRP REBALANCE



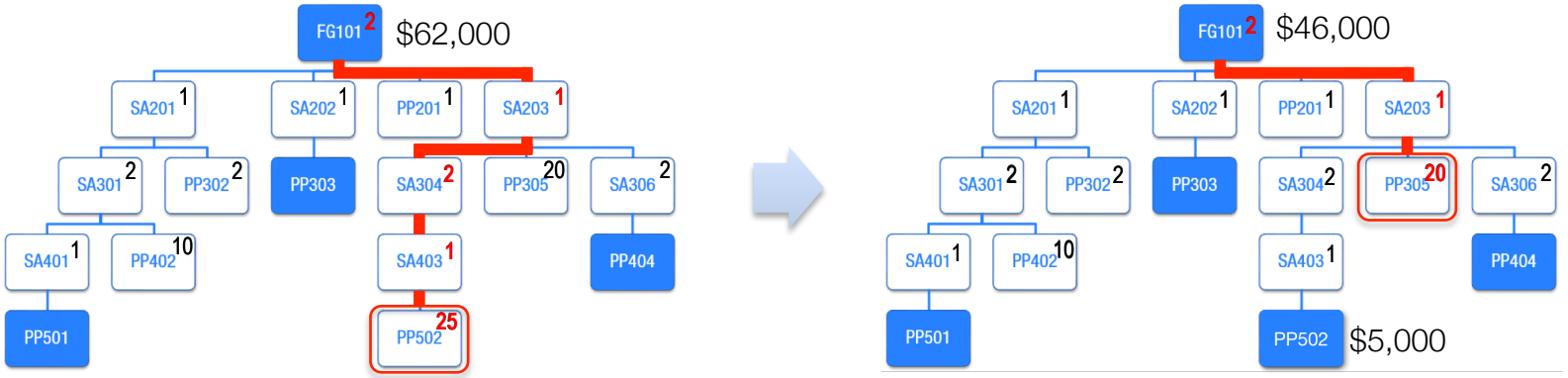
DDMRP breaks down MRP's bi-model distribution of part availability for strategic inventory decoupling lead time, dampening variability and minimizing employed working capital.

DDMRP METHODOLOGY

5 Point Plan for DDMRP Development

DDMRP INTELLIGENT ASSISTANT

- Strategic Inventory Positioning (Step 1)
  - Key factors that must be achieved
    - Absorb variability
    - Decouple lead time
    - Provide a Return on Capital Employed (ROCE)
  - Enables lead time reduction and inventory optimization
    - The Decoupled Lead Time (DLT) is the longest unprotected/unbuffered sequence in the BOM



PP502 should be considered to be strategically positioned inventory as longest DLT is 31 days to produce FG101.

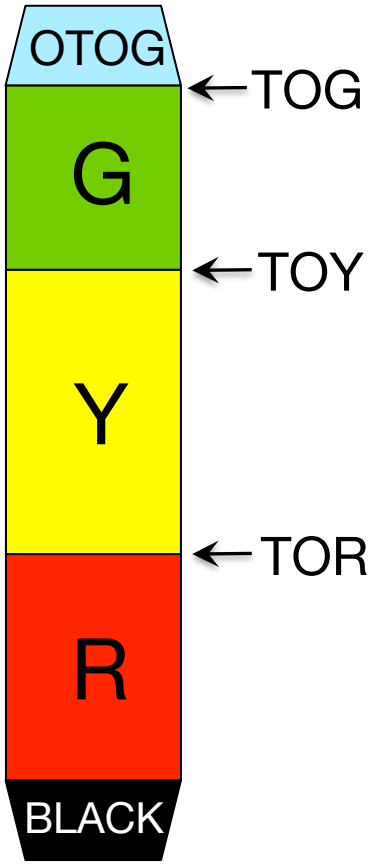
Strategic positioning of PP502 will mean the DLT path would move to PP305. DLT now 23 days for FG101.

DDMRP INTELLIGENT ASSISTANT

- Buffer Profiles: Requirements (Step 2)
  - Buffer Profiles enable groups of parts with similar traits to be allocated into particular Buffer Profiles with specific attributes defining:
    - Item Type
      - Manufactured, Purchased and Distributed
    - Level of Variability in Demand and Supply
      - Low, Medium and High
    - Length of Decoupled Lead Time
      - Short, Medium and Long
  - Sound statistically methodologies utilized to analyze demand profiles and historic performance within manufacturing and of suppliers

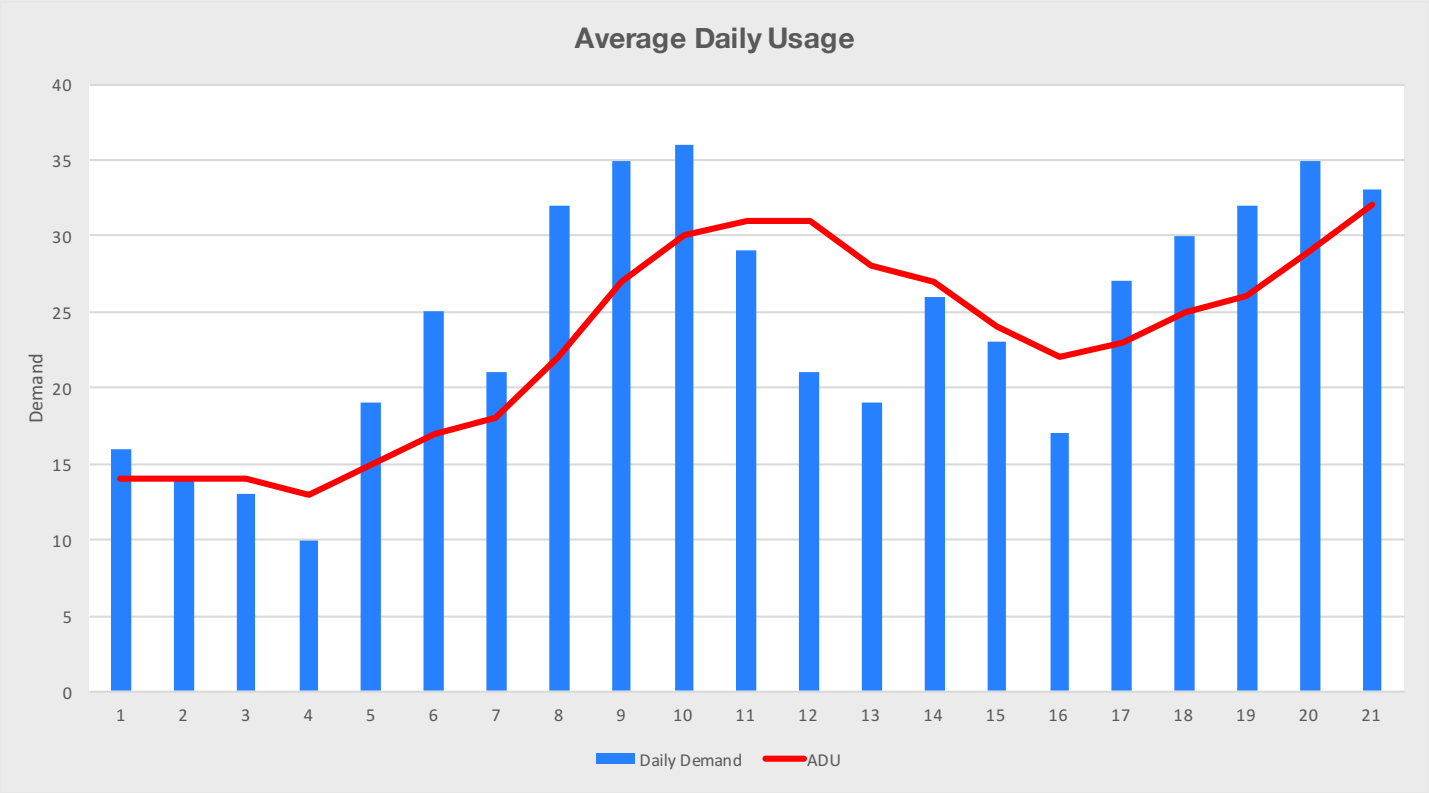
SIMPLICITY OF DDMRP

- 3 Buffer Zones indicated by color and representing the state of the inventory system:
  - Green: Part requires no action
  - Yellow: Parts requires replenishment
  - Red: Part may require special attention
- Size of Buffer based on:
  - Buffer Profile traits
    - Item Type / Variability / Lead Time
  - SKU traits
    - Average Daily Usage (ADU) / Demand Driven Lead Time / Ordering Policies
- Available Stock is compared against buffer levels to determine Planning and Execution priorities



DDMRP INTELLIGENT ASSISTANT

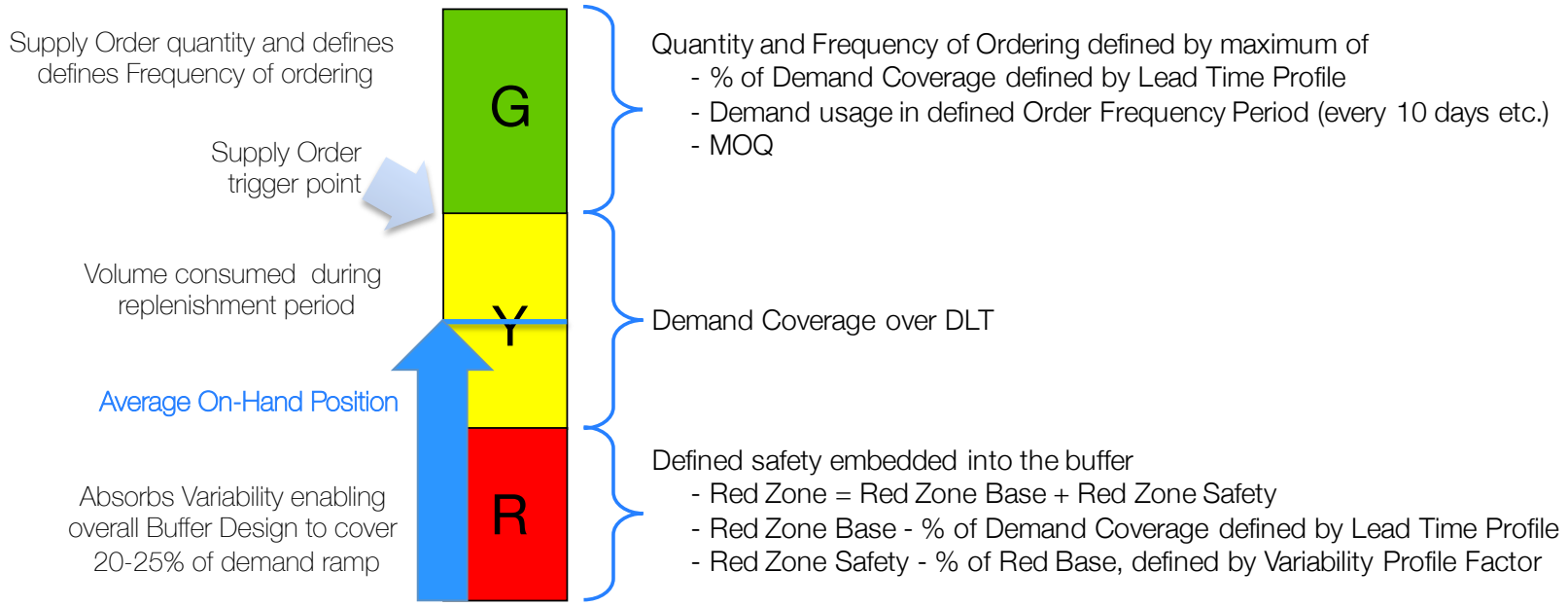
- Buffer Zones: Requirements (Step 2)
  - Rolling average of demand defined as Average Daily Usage (ADU) measured daily to sensing changes in demand.



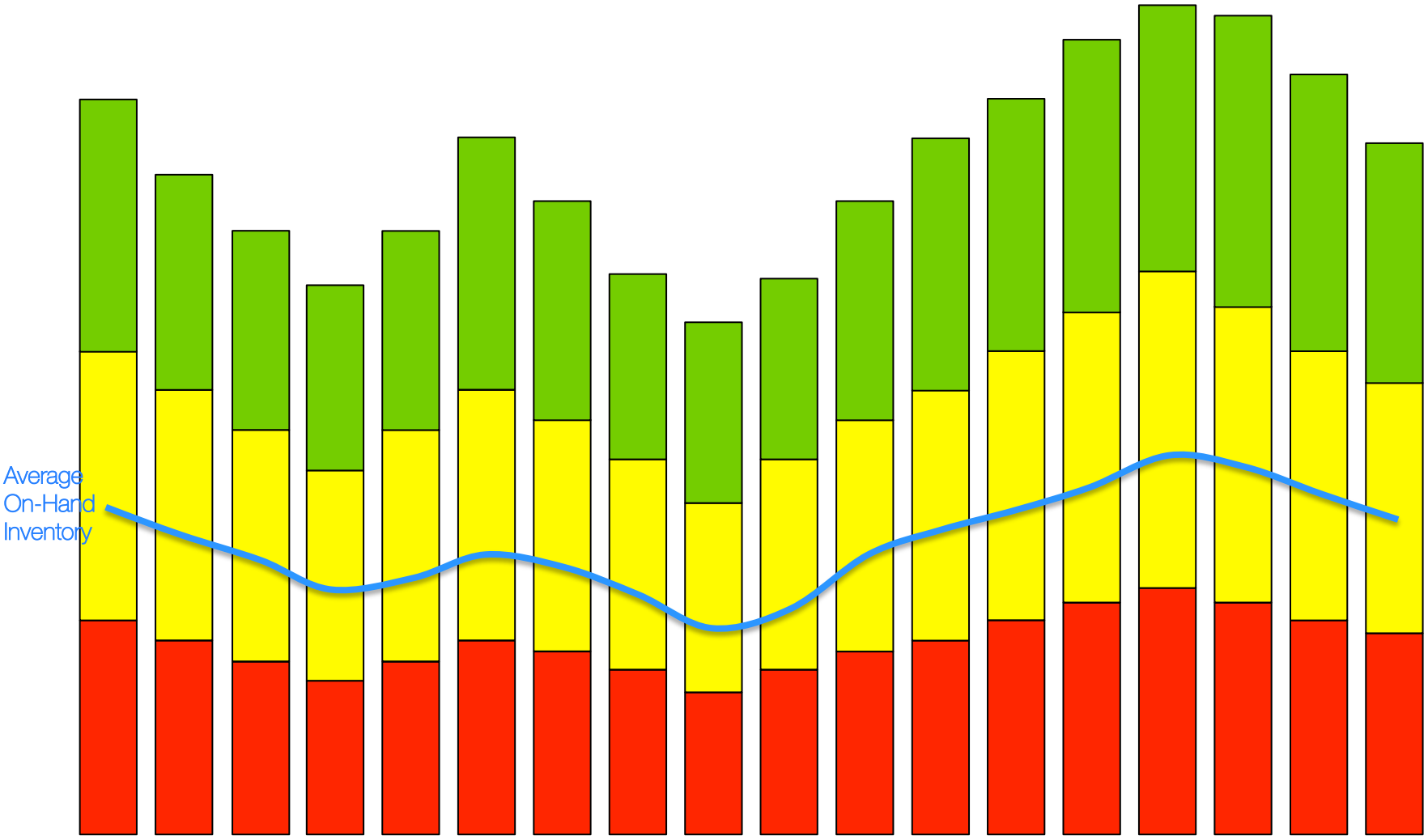
DDMRP INTELLIGENT ASSISTANT

Buffer Zones: Design

- Buffer Zones defined through simplistic color coding system, with levels of inventory being defined for each zone.
- Utilized for DDMRP Planning
- Zone definition

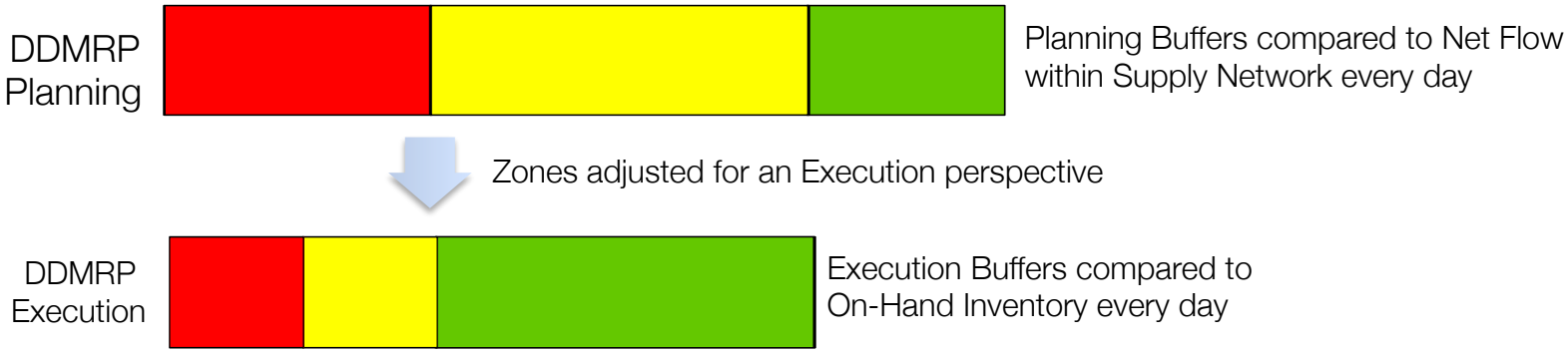


DYNAMIC SIZING



DDMRP INTELLIGENT ASSISTANT

- Visible & Collaborative Execution
  - Focus changes from Net Flow between points of consumption and supply to review On-Hand Inventory.
  - Priority based on On-Hand Buffer Status, not Due Date in MRP Execution.



Execution Buffer Zones

Red	50% of Planning Red Zone
Yellow	50% of Planning Red Zone
Green	100% of Planning Yellow Zone

On-Hand Buffer Status Alerts (Top of Yellow = 100%)

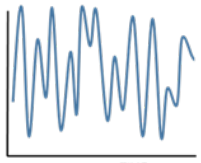
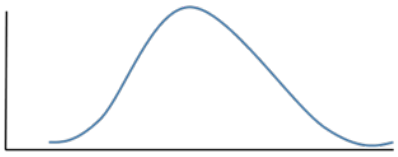
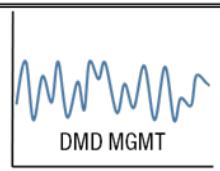
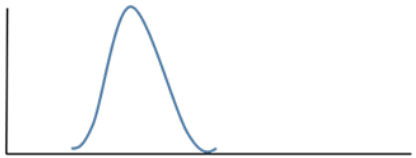
Red	Critical	≤50% On-Hand Buffer Status
Yellow	Alert	≤100% On-Hand Buffer Status

DEMAND DRIVEN VERSUS TRADITIONAL

Model	FDU	ADU	DVI	LT	New Order	SS	MIN / MAX	MIN / MAX AVG	DDMRP AVG	FCST ACCY
A	35	20	2.4	10d	10d	233	100 / 433	325	293	57%
B	20	14	1.8	5d	5d	163	70 / 233	175	118	70%
C	5	15	4.1	60d	60d	175	75 / 1,075	806	440	33%
Total	**60**	**49**				**571**	**245 / 1,741**	**1,306**	**851**	**54%**

- MRP will not use safety stock, therefore it is stagnant inventory levels that must be consistently managed and updated. MRP uses safety stock as a floor that it wants to constantly keep that amount on hand.
- Min / Max levels attempt to be Demand Driven but are calculated on static forecast numbers and positions inventory across the board.
- DDMRP senses and shapes changes in Demand, with dynamic adjustments at strategic locations where a positive ROCE is present.

IMPACT OF DDMRP

#	If DEMAND is	And RESPONSE CYCLE is	then INVENTORY REQUIRED	
			WIP	FINISHED GOODS
1				
2				
				

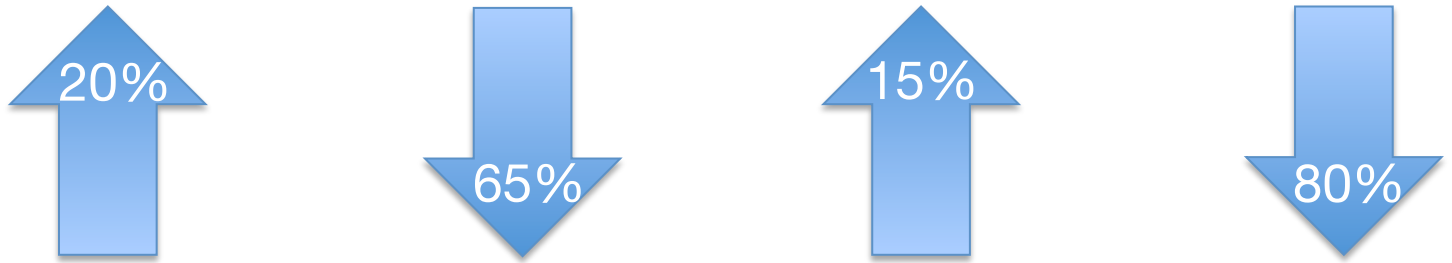
The key to effectively leveraging working capital and capacity is to find the places where inventory can have the biggest impact and provide the greatest return otherwise system operates as a small node with no positioned inventory.

BENEFITS STORY FOR DDMRP

Top issues facing most Supply Chains

Reduce costs while improving customer service levels	Pressure to Improve Inventory Turns	Complexities with the Global Supply Network	Growing lead times through the entire Supply Network

Benefits of DDMRP based on case studies by the Demand Driven Institute.



Customer Service Levels	Inventory Raw Material, FGI and WIP	Planner / Scheduler Availability	Replenishment times

Achieve these types of results for ~$50-75k+ annual investment

+ $75k investment is based on standard enterprise installation for one site, $50k annual license fee and $25k in implementation. Price and results can vary based on size, scale and complexity.

WHY CHOOSE TheONE DDMRP

Benefit #1	• Typical implementation costs of ~$75k ($50k annual license fee w/$25k in implementation)
Benefit #2	• Entire Supply Chain efficiency improvement
Benefit #3	• Leverage MRP with a JIT, DFT, Lean, Agile approach
Benefit #4	• Improved service to customers
Benefit #5	• Reduce inventory w/o the sacrifice of service
Benefit #6	• Move away from reliance on inconsistent forecasts

Introduction: highimpact

Our Mission is to revolutionize manufacturing as the worldwide leader in Demand Flow Technology (DFT) deployments and training.

We have over 75 years of combined experience in client transformations. We bring specialties in Lean, Six Sigma and Demand Driven Supply Chain.

Results Driven - Progressive thinking that delivers impactful results of up to 50% reduction in working capital, 20% improvement in customer service, 10% reduction in Costs of Goods Sold (COGS) and 15% improvement in Safety performance.

Customer Focused - Offer consistently great and impactful solutions to deliver bottom line results. Our integrations are tailored to fit your needs, not the other way around.

Thought Leadership - Pushing the boundaries of our industry for over 30 years, with a total of 75 years experience in combining the speed of Lean, the power of DFT, whilst utilizing the structure and process of Six Sigma in a Demand Driven world.

ORCA SCM Solutions

- Strategic Partner of High Impact

- Consulting Services: Partner intimately with small to medium sized businesses to achieve financial and operational excellence by aligning, fully developing and leveraging the organization to achieve its most vital strategic goals.

- Supply Chain Services:
  - Performance Excellence
  - Business Development
  - Supplier Selection and Development
  - Inventory Optimization for Superior Service and ROCE

DDMRP–The New Standard of MRP: Wrap Up

- Q & A

- THANK YOU!!!