



Demand Driven Adaptive Enterprise

Where are you on the road to Demand Driven?

Presented by Debra A. Smith, CPA, EMBA, TOCICO
Managing Partner Constraints Management Group

Agenda



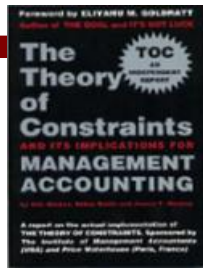
- CMG's journey of discovery;
- The State of Demand Driven today - DDAE;
- Demand Driven Operating Model Criteria;
- DD Flow Based Metrics;

CMG - Thought Leadership



- Demand Driven Materials and Supply Chain Planning & Execution
- Demand Driven Resource Scheduling
- Demand Driven Finance & Smart Metrics
- Strategic Thinking Processes

Our Journey of Exploration

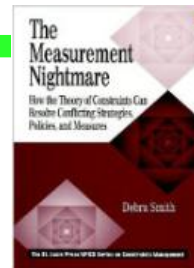


1995



1998

- The Power of Decoupling:
- \$35M inventory decrease
 - Lead time 90 to 14 days
 - Sales up +20%

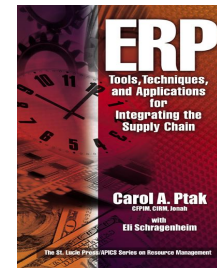


1997

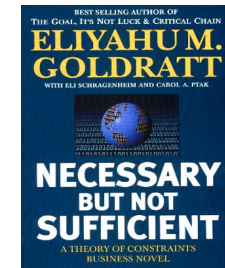


2001 -2003

- The Power of Vertical Integration:
- \$30M inventory decrease
 - ROI from 4 to 18%
 - Lead time 3 weeks to 3 days



1999



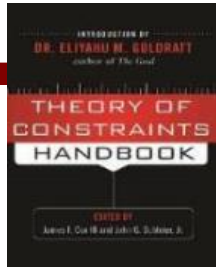
2000



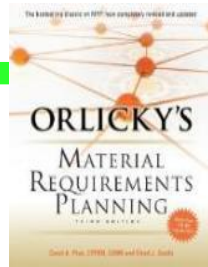
2005 -2006

- The Power of the Right Rules/Tools DBR+™/R+®:
- Sales up 12%,
 - Inventory down 24%,
 - Income up 21%,
 - Cash flow doubled,
 - Foundry lead times 2 weeks to 2 days,

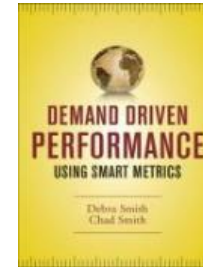
Our Journey of Exploration



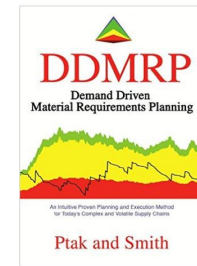
2010



2011



2013



2016

corona



2004-2009

Analyze Deep and Broad Product/Project Structures:

- OTD 60% to +95%
- ROI from 5 to 22%
- Lead time 24 to 10 weeks Equipment
- Lead time 27 mos. to 12 mos. Drilling Rigs
- 6 X revenue with .8 inventory increase

2011 -2014

The Prioritized Share Equation & Hybrid Distribution:

- 45% decrease finished goods
- 18% decrease raw and pack
- 99.7% service levels

2015-2017

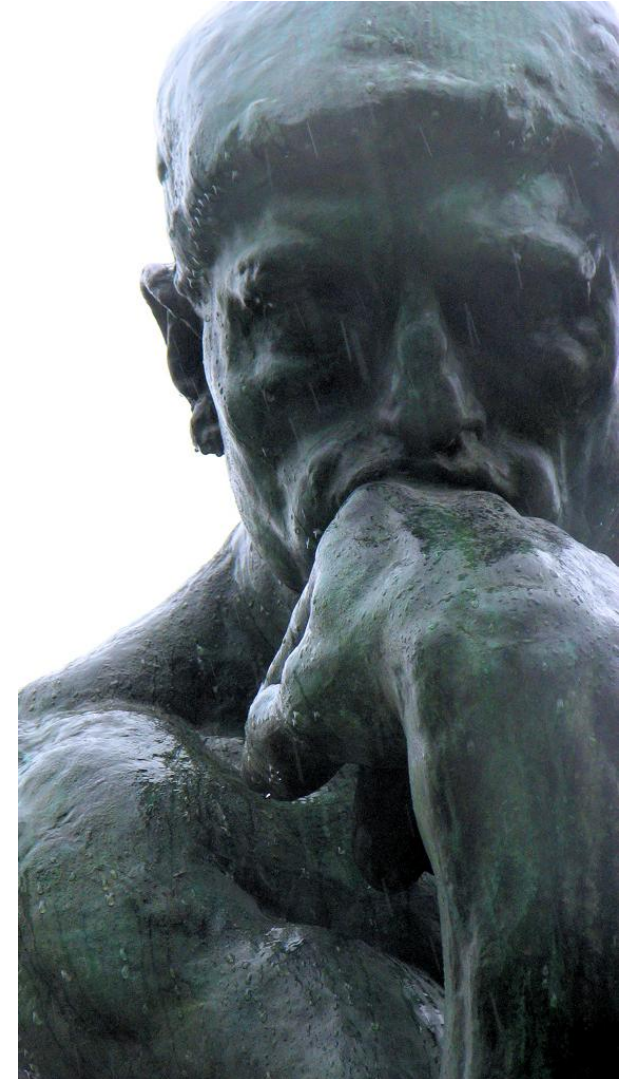
Demand Driven Adaptive Enterprise

- Demand Driven Operating Model
- Demand Driven S&OP
- Prioritized Share Equation for critical capacity scheduling & execution

Thoughtware Begins and Sustains A Demand Driven Journey



- Thoughtware BEFORE hardware and software! Invest in people's ability to think and problem solve systemically.
- If you can't think systemically then you can't observe, identify and resolve distortions to relevant information and materials at the systemic level.
- That means your organization is INCAPABLE of thinking and adapting for FLOW at all levels.
- Ensuring and maintaining a framework for the four pre-requisites for relevant information should be the primary job of senior management.
- The Design of a Demand Driven Operating Model requires System Thinking – Thoughtware!



Thoughtware

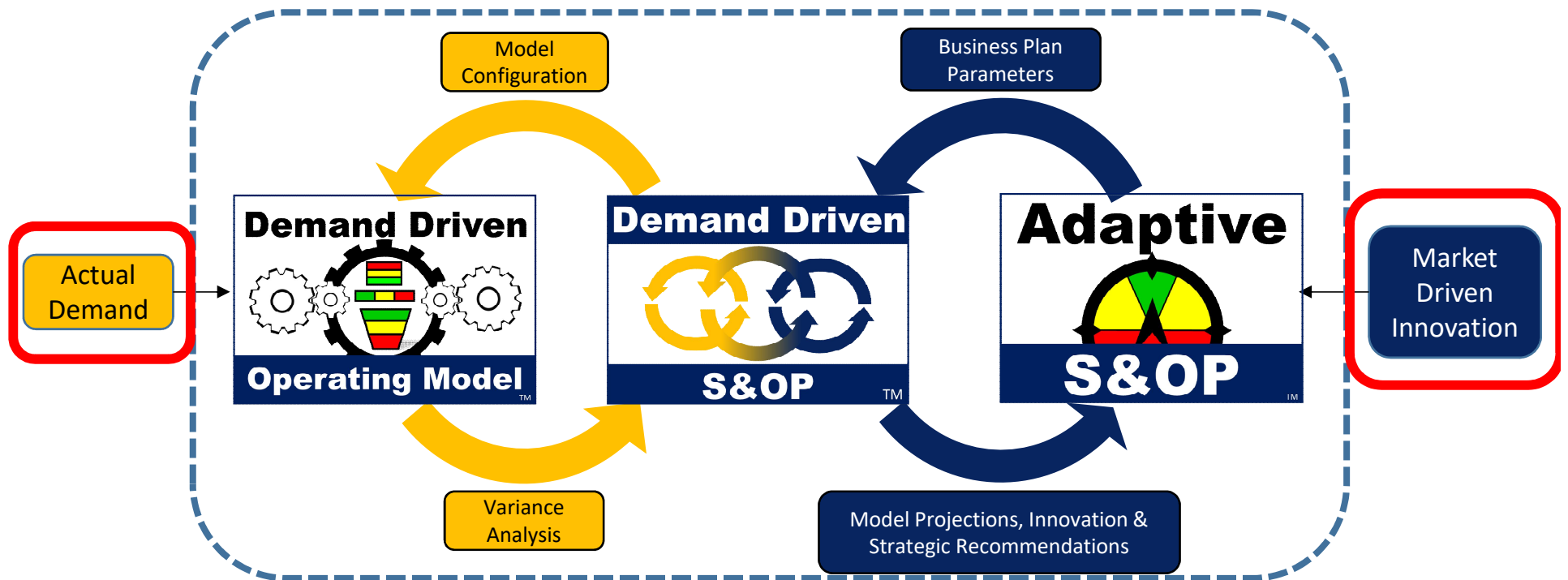


These prerequisites define the necessary components for an Organization to think, communicate and behave systemically:

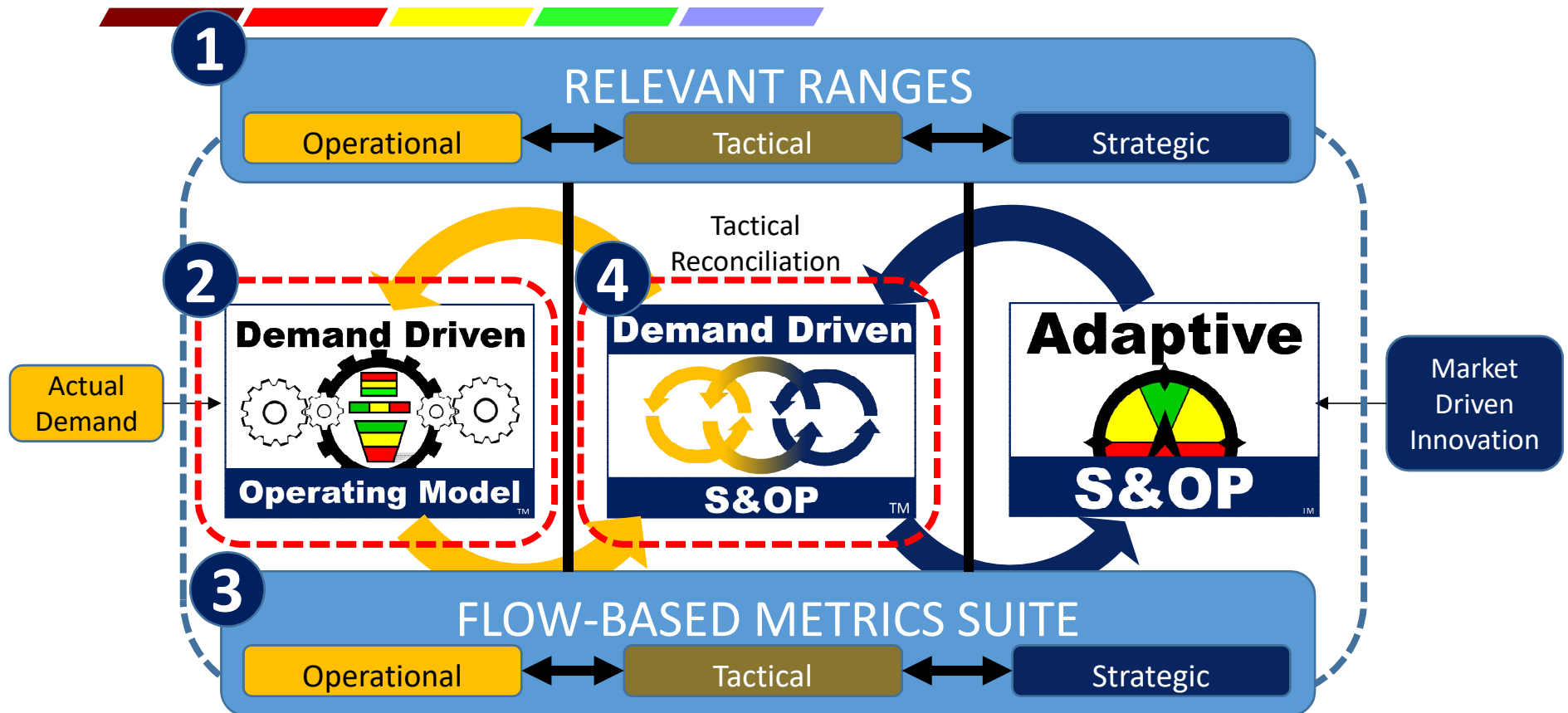
1. Understanding the supply chain relevant ranges;
2. Challenge and resolve conflicting Cost/Flow metrics
3. Design/implement a flow-based operating model;
4. Capture and trend flow-based metrics – “Smart Metrics”;
5. Routinize the operational and tactical range communication feedback loop to challenge the model attributes with monthly reconciliations;
6. Adapt the model – change the model attributes or your work practices/policies.

When these prerequisites are in place an organization has a functioning DDOM. “Thoughtware” installed for flow is a necessary condition to operate and sustain Demand Driven.

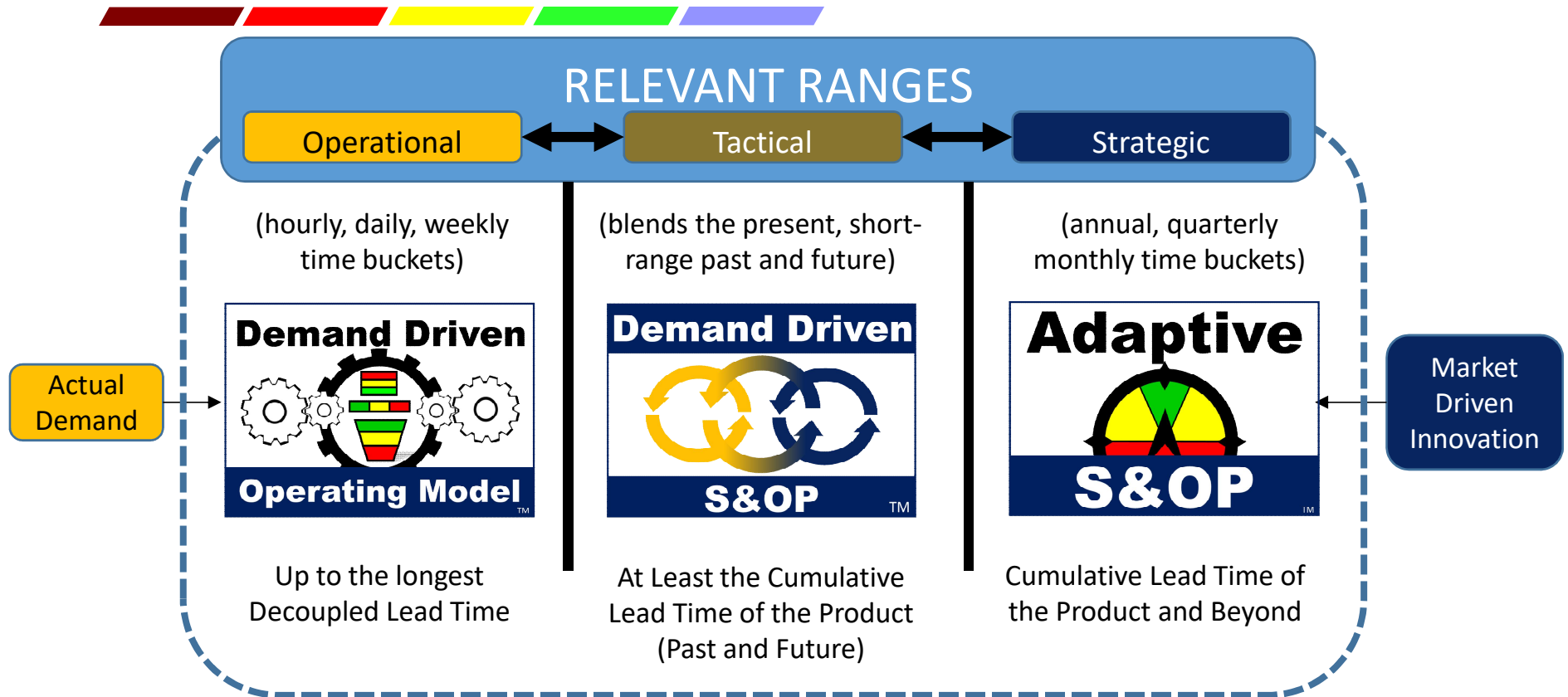
Demand Driven Adaptive Enterprise Model



Demand Driven Adaptive Enterprise Model



1. Relevant Ranges in the DDAE Model







Demand Driven Is About Visibility For Flow!





The Missing Element

$\Delta\text{Visibility} \rightarrow \Delta\text{Variability} \rightarrow \Delta\text{Flow} \rightarrow \Delta\text{Cash Velocity} \rightarrow \Delta\left(\frac{\text{Net Profit}}{\text{Investment}}\right) \rightarrow \Delta\text{ROI}$

Variability is defined as the summation of the differences between our plan and what happens.

Variability  = Flow 
Variability  = Flow 

Visibility is defined as **relevant information** for decision making.

Visibility  = Variability 
Visibility  = Variability 

Relevant Information = Flow Based Metrics = “Smart Metrics”

Four Prerequisites for Relevant Information



1. Understanding Relevant Ranges
2. Implement a Flow-Based Operating Model
3. Implement Flow-Based Metrics
4. Tactical Reconciliation (bi-directional) between Relevant Ranges

1. Relevant Ranges

Forecasts are relevant in the long range, not the short range.
Fixed costs are variable in the long range, not the short range.

A work order delay is relevant in the short range, not the long range.
A machine breakdown is relevant in the short range, not the long range.

- Relevant Range = The time frame in which assumptions are valid
- The assumptions and information that are valid and relevant will differ between these ranges.
- Force fitting irrelevant assumptions into the wrong range will lead directly to distortive information.
- Different relevant ranges are typically utilized by different personnel



Demand Driven Adaptive Enterprise Levels



DDAE III	Sensing, Adapting and Innovating across the supply chain (customers and suppliers) for continual ROI improvement. Mature DDAE Model.
DDAE II	Leverage the Demand Driven Operating Model capability across the enterprise and into the market. DDS&OP and Adaptive S&OP in place.
DDAE I	Synchronizing and leveraging operational capability for better flow performance. Expand the implementation of a Demand Driven Operating Model.
Stage 2	Begin to emphasize flow-based operational efficiency with the preliminary implementation of DDMRP.
Stage 1	Focused on cost-based operational efficiency (Cost reduction AND Responsiveness in conflict).

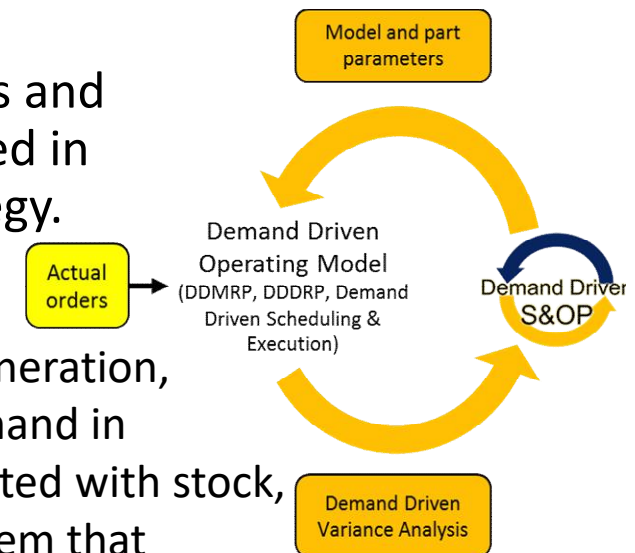
Visibility and Thoughtware determine an Organization's ability to adapt and improve flow!

The DDAE Development Path

Stage	1	2	3	4	5
Operating Description	Operational Efficiency (Cost)	Operational Efficiency (Flow)	DDAE I	DDAE II	DDAE III
Operational Objectives	<ul style="list-style-type: none"> Cost Reduction Focus on Response 	Flow Protection and Promotion	Fully synchronize and leverage operational capability for better flow performance	Leverage the Demand Driven Operating Model capability across the enterprise and into the market	Sense, Adapt and Innovate across the organization and supply chain (customers and suppliers).
Demand Driven Characteristics	Conventional MPS, MRP, DRP and MES practices. Demand Driven principles are limited to the Incorporation of actual demand into supply order generation. Strategic chronic conflict between cost and service.	Trial and/or expanding implementation of Demand Driven Material Requirements Planning (DDMRP).	Trial and/or expanding implementation of the Demand Driven Operating Model (DDOM) with supporting Operational Metrics Objectives. Beginning to explore DDS&OP process.	A mature DDOM with the strategic and tactical reconciliation process of DDS&OP with Adaptive S&OP in place. Operational and Tactical Metric Objectives in place.	A mature DDOM with mature DDS&OP and Adaptive S&OP and DDAE metrics capability. Thoughtware fully installed.
Primary Metrics	<ul style="list-style-type: none"> OEE Fully Absorbed Unit Cost Service 	<ul style="list-style-type: none"> Signal Integrity Decoupling Point Integrity Average Inventory Service 	<ul style="list-style-type: none"> Reliability Stability Velocity 	<ul style="list-style-type: none"> Strategic Contribution Waste/Improvement Local Operating Expense Control RACE/ROIC 	<ul style="list-style-type: none"> RACE/ROIC Improvement Rate
Analytics	<ul style="list-style-type: none"> Absorption Rates Total Days of Inventory OTD and/or fill rates 	<ul style="list-style-type: none"> OTOG % and \$ % to inventory target OTD and/or fill rates 	<ul style="list-style-type: none"> Buffer Run Charts Reason Code Analysis Flow Exception Reports Flow Indices 	<ul style="list-style-type: none"> Outlier Analysis (Time, Capacity and Stock Buffers) Buffer Compression Throughput Rate and Volume Improvement 	<ul style="list-style-type: none"> Strategic Conflict Definition and Resolution
Education	Traditional SCM and Financial training and education	Precisely Wrong Workshop, Demand Driven Planner (DDP)	DDP, Demand Driven Leader (DDL), Demand Driven Analyst (DDA)	DDP, DDL, DDA, Adaptive S&OP Workshop	DDP, DDL, DDA, Adaptive S&OP Workshop, Strategic Solutions Program (SSP)
Personnel Capability	Traditional SCM and Financial training and education	Personnel are aware of and capable of describing the problems with conventional planning systems. They are well versed in DDMRP principles and are capable of implementing (at a cursory level) decoupling point buffers.	Personnel understand the broader implications of DDMRP to the organization. Personnel understand how to implement Demand Driven Scheduling and Execution. Personnel are capable of adjusting the DDOM based on performance analytics.	Other functional personnel now understand the requirements and capabilities of the DDOM. Personnel are able to successfully bridge the tactical and strategic relevant ranges. They can project, recommend and adapt.	Strategic personnel are able to analyze complex problem areas (Internal and external), define strategic conflicts and constraints and recommend strategic policy/direction changes. They are able to mentor new key personnel through the DDAE.

Demand Driven Operating Model (DDOM)

A Demand Driven Design begins with the stated business and market strategic objectives (strategic lead time and market emphasis). The Model's key parameters/attributes are populated with the "current reality" of resource capacities and demand variation (time standards). Then buffers are dialed in to protect the control points and deliver the market strategy.



A *Demand Driven Operating Model (DDOM)* is a supply order generation, operational scheduling and execution model utilizing actual demand in combination with strategic decoupling and control points protected with stock, time and capacity buffers. It creates a predictable and agile system that promotes and protects the flow of relevant information and materials within the tactical relevant operational range (hourly, daily and weekly).

**A DDOM follows the *Right Rules* –
“Complex Adaptive System Rules”**

***Flow Based Metrics* are an outcome
of following the “Right Rules”**

2. Right Rules For DDOM

Demand Driven Model

$\Delta\text{Visibility} \rightarrow \Delta\text{Variability} \rightarrow$

Core Conflict Area

Demand Driven Flow map of connections and interconnections

Create Short, independent planning horizons

Strategic control points govern and leverage the system output

All buffers use Paretian models to identify lever point phenomena events to signal action, priority and opportunity.

Visible buffer and control point status use a Paretian view to create a learning feedback loop to drive improvement.

Operating the Demand Driven Model (Tactical Time Frame)

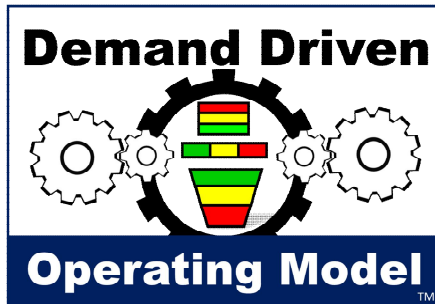
$\Delta\text{Flow} \rightarrow \Delta\text{Cash Velocity} \rightarrow \Delta \left(\frac{\text{Net Profit}}{\text{Investment}} \right) \rightarrow \Delta\text{ROI}$

Plossl's First Law of Manufacturing

Smart Metrics are a DDOM outcome:

- They drive tactical planning and execution to flow;
- They connect flow to ROI operationally, tactically and strategically.

2. The Flow-Based DDOM Criteria

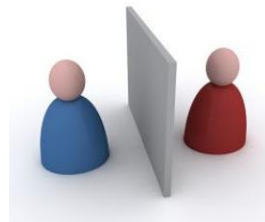


Combines elements of MRP, DRP, Lean, Theory of Constraints, Factory Physics and Six-Sigma.

Paces operations to **actual demand**



Strategically places **decoupling points** for lead time compression and variability (bullwhip) mitigation.



Strategically places **control points** for schedule synchronization



Protects decoupling and control points through **stock, time and capacity buffers**



The Right Design Rules Create Visibility

Demand Driven Model

$\Delta\text{Visibility} \rightarrow \Delta\text{Variability} \rightarrow$
Core Conflict Area

Demand Driven Flow map of connections and interconnections

Create Short, independent planning horizons

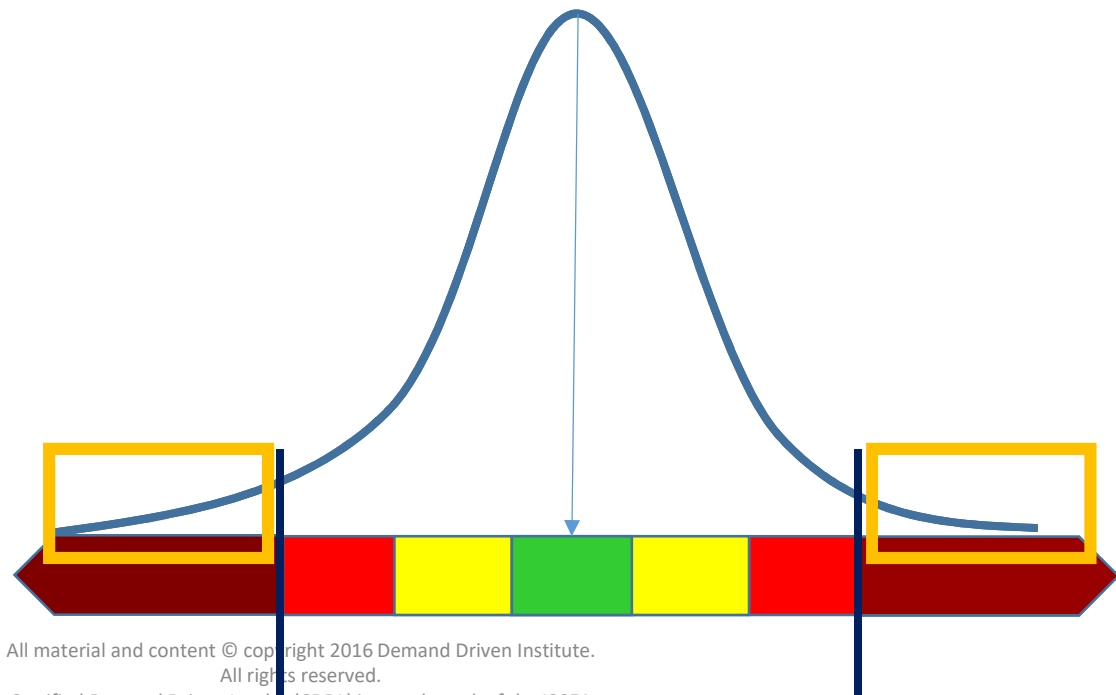
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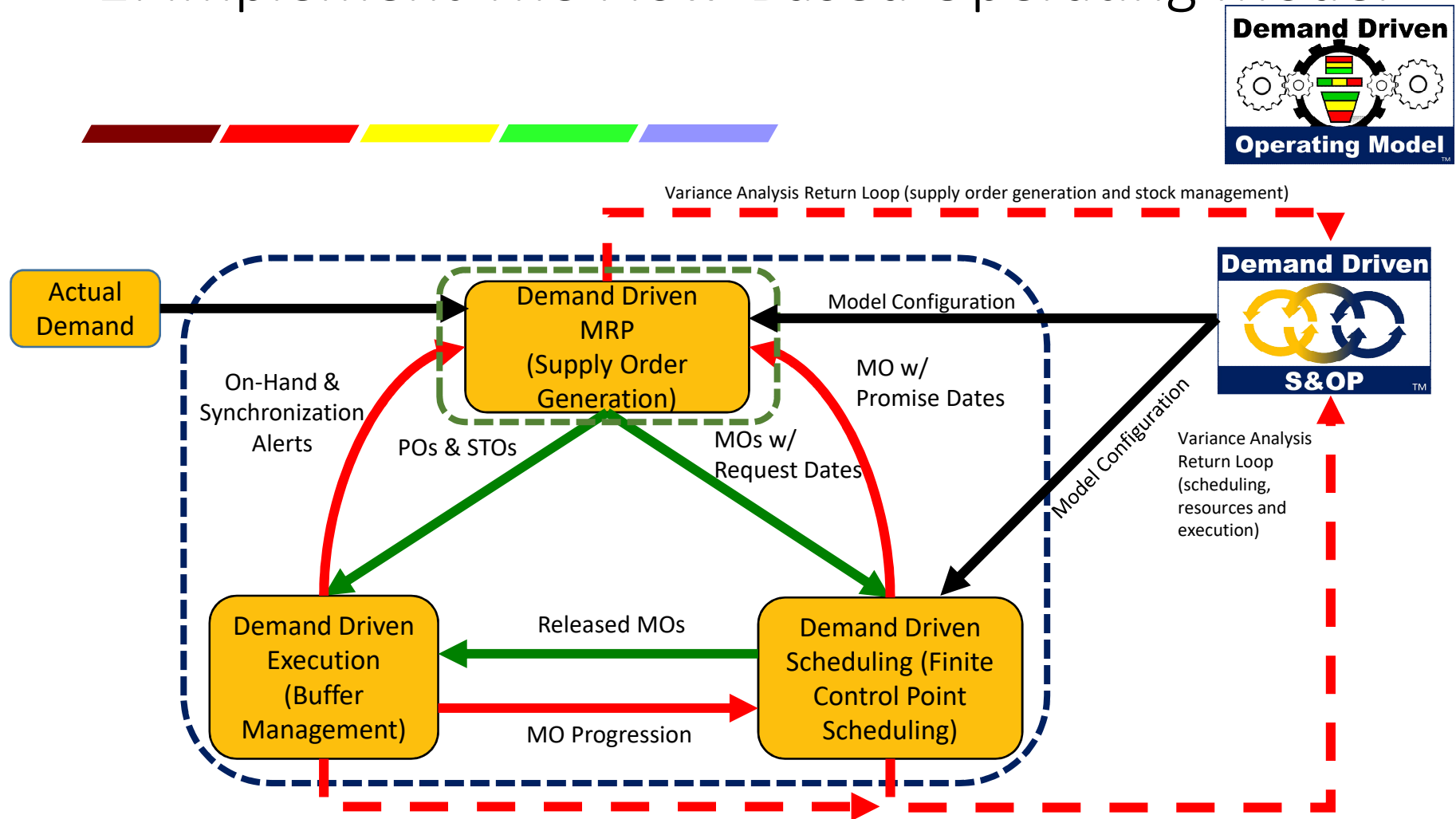
Visible buffer and control point status use a Paretian view to create a learning feedback loop to drive improvement.

Operating the Demand Driven Model

Paretian statistical models – The tails of the distribution identify the few critical points that define the relevant information to ***design, manage, predict and adapt*** nonlinear complex systems.



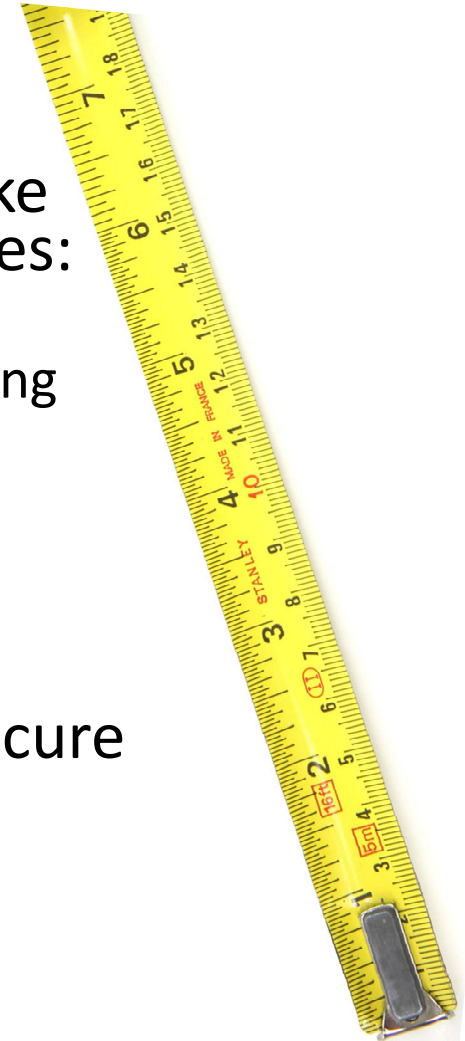
2. Implement The Flow-Based Operating Model



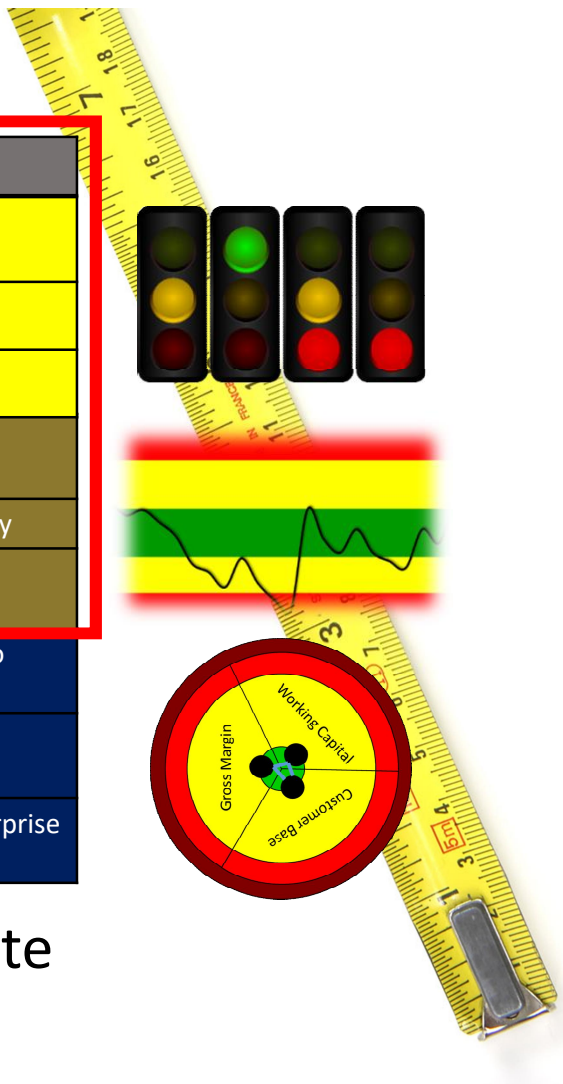
3. Flow-Based Metrics End Cost Conflict



- Any suite of flow-based metrics must take into account the other three prerequisites:
 - ✓ The metrics must fit the range
 - ✓ The metrics must fit the flow-based operating model
 - ✓ The metrics must be reconcilable between ranges.
- Force fitting non flow-based metrics will directly lead to conflicts and distortions throughout the organization – it will obscure what is relevant!



Flow-Based Metrics in the DDAE Model



	Metric Objectives	The Message Behind the Objective
Operational	System Reliability	Execute to the model, plan, schedule and market expectation;
	System Stability	Pass on as little variation as possible;
	System Speed/Velocity	Pass the right work on as fast as possible;
Tactical	System Improvement & Waste Reduction (Opportunity \$)	Identify and prioritize obstacles/conflicts to flow
	Local Operating Expense Control	Spend minimization to capture the market opportunity
	Strategic Contribution	Maximize system return according to relevant model factors (volume and rate)
Strategic	Contribution Margin (cash generation rate)	Drive innovation (internal and external) and growth to increase cash generation capability (RATE)
	Working Capital (inventory & cash & credit)	Ensure proper levels of working capital to protect and promote flow in the short and long term
	Customer Base (market share, sales & service & quality)	Ensure and grow a solid base of business for the enterprise (VOLUME)

Without a functioning DDOM you can't generate Flow based operations and tactical metrics!

DDMRP Is A Good Start But.....



It is one component of a Demand Driven Operating Model and a DDOM is a necessary condition of a functioning Demand Driven Adaptive Enterprise;

The DDAE model spans all three relevant ranges that determine relevant information.

DDOM is the heart of DDAE and ***Flow Metrics = Smart Metrics.***

What are you leaving on the table?

Still Stuck in Conflicting Metrics!



- Convention has some flow-based metrics in use.
- Their effectiveness is limited by conflicting cost-based metrics.
- These conflicting metrics obscure what is relevant and introduce self-imposed variability within organizations as personnel oscillate between protecting flow and protecting cost performance.
- When flow is promoted and protected, costs are under control. The inverse, however, is not true.

$$\Delta \text{Flow} \rightarrow \Delta \text{Cash Velocity} \rightarrow \Delta \left(\frac{\text{Net Profit}}{\text{Investment}} \right) \rightarrow \Delta \text{ROI}$$

Due Date Performance
Fill Rates
Inventory Turns

$$\Delta \text{Cost} \rightarrow \Delta \text{Cash Velocity} \rightarrow \Delta \left(\frac{\text{Net Profit}}{\text{Investment}} \right) \rightarrow \Delta \text{ROI}$$

OEE
Fully Absorbed Unit Cost

Demand Driven Operational Model Dashboard

Reliability

Planner, Buyer, Scheduler

- Net Flow & On Hand Stock Status
- Order Acceptance & Launch Timeliness
- Control Point Schedule Maintenance

Part	Open Supply	On-hand	Demand	Net Flow	Recommended Supply Qty	Action
BB97	16359	18000	8000	21359 (127%)	14743	Create Work Order
H275	900	5532	960	5472 (42%)	2128	Create Work Order
C283	1530	3721	713	4538 (48%)	1594	Create Work Order
P100	1200	1350	870	1280 (58%)	2206	Create purchase order

Date	Chicken Truffle		Chicken Noodle		Beef Stew		Minestrone	
	DOMRP Recommendation	Actual	DOMRP Recommendation	Actual	DOMRP Recommendation	Actual	DOMRP Recommendation	Actual
1-Oct								
2-Oct	1200							
3-Oct	1200	1800			1200	1800	1900	
4-Oct								
5-Oct								
6-Oct			2400					
7-Oct			2600					
8-Oct			2950					
10-Oct			3500				2150	2150
11-Oct			4200					
12-Oct	1700		6000					
13-Oct	1700		6200	6200			1200	
14-Oct	1900							
15-Oct	1950							

C1 (Control Point) Schedule Status									
Work Order	Order Qty	Part	Customer	Expedite Status	In progress at C1 - LATE TO START	Start	Full Duration	Start Qty	End Qty
156009-5	22	2000	Starbucks	Expedite	In progress at C1 - LATE TO START	9/13/2015 14:53:53	08 hours	22	0
133002-1	40	2001	Alaska Airlines	Expedite	In progress at C1 - EARLY TO START	9/2/2015 18:22:17	17 hours	40	32
156010-8	18	2001	Alaska Airlines	Expedite	Completed at R4	9/16/2015 10:22:08	08 hours	0	0
156009-2	17	2000	Starbucks	Expedite	In progress at R14	9/16/2015 15:58:58	08 hours	0	0
156001-1	15	5000	Sony Corp	Expedite	In progress at R12	9/19/2015 8:30:22	02 hours	0	0
156001-2	20	2000	Starbucks	Expedite	In progress at R2	9/19/2015 11:20:46	08 hours	0	0
156001-3	15	5000	Sony Corp	Expedite	In progress at R2	9/19/2015 11:20:46	08 hours	0	0
156009-7	20	2000	Starbucks	Expedite	Released, awaiting start	9/13/2015 12:28:00	08 hours	0	0
156009-8	20	2000	Starbucks	Expedite	Released, awaiting start	9/14/2015 12:28:00	08 hours	0	0

If the control points are on time the system is on time

Stability

Buffer Manager, Resource Manager

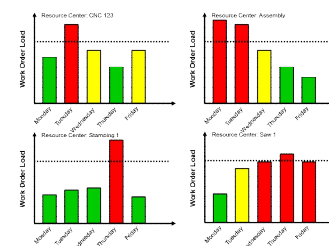
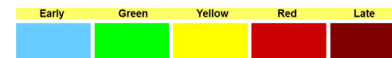
- Stock Buffer Status
- Time Buffer Status
- Capacity Buffer Status
- Reason Code Capture

Part	Open Supply	On-hand	Demand	Net Flow	Recommended Supply Qty	Action
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H275	900	5532	960	5472 (42%)	2128	Create Work Order
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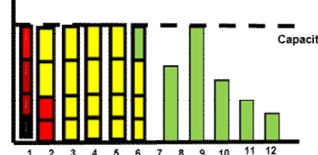
Yet to Be Received



Received



Drum Prioritized Finite Capacity Load



Velocity

Buffer Manager, Resource Manager, Scheduler

Flow Exception Reporting:

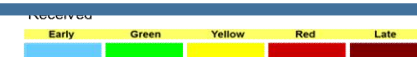
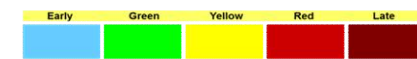
- Release Schedules
- Progress to Next Critical Scheduled Activity
- Critical Scheduled Activity (Control Points)



Work order progression

Resource Schedule														
Resource: C1 - Resource C1 (constraint)														
Filter: 0 Constraints 0 Non-Constraints 0 All														
Ready	Work Order	Order Qty	Part	Customer	Priority	Expedite	Status	Start	End	Full Duration	Release Qty	Start Qty	End Qty	Operation Name
156009-5	22	2000	Starbucks	Expedite	5	Released, awaiting start	2/4/2016 4:41 PM	2/12/2016 4:41 AM	7:17 hours	0	0	0	0	0000 - H01 B.000
156010-8	18	2001	Alaska Airlines	Expedite	7	In progress at R2	2/12/2016 4:47 PM	2/12/2016 2:07 PM	2:17 hours	0	0	0	0	0000 - H01 B.000
156009-2	17	2000	Starbucks	Expedite	4	Released, awaiting start	2/4/2016 5:05 AM	2/4/2016 1:11 PM	3:77 hours	0	0	0	0	0000 - H01 B.000
156009-7	15	5000	Sony Corp	Expedite	4	Released, awaiting start	2/4/2016 5:05 AM	2/4/2016 5:05 AM	4:17 hours	0	0	0	0	0000 - H01 B.000
156009-4	20	2000	Starbucks	Expedite	4	Released, awaiting start	2/12/2016 5:30 PM	2/4/2016 5:05 AM	4:57 hours	0	0	0	0	0000 - H01 B.000
156011	15	5000	Sony Corp	Expedite	5	Released, awaiting start	2/4/2016 1:11 PM	2/4/2016 9:40 PM	8:29 hours	0	0	0	0	0000 - H01 B.000

Yet to Be Received



Control Points:

- Late to release
- Late to start
- Late to complete
- Late to ship
- Protection status

3. Operate The Demand Driven Model

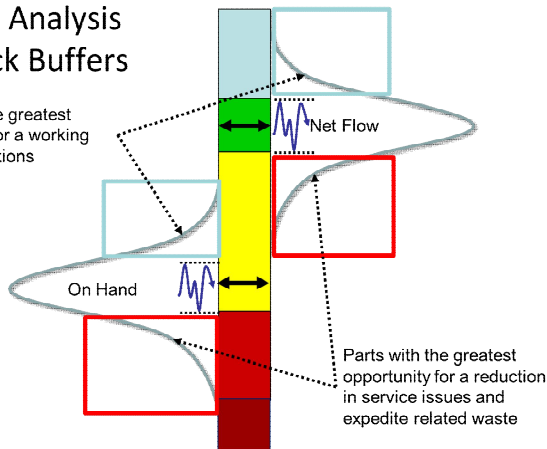
Paretian statistical models – The tails of the distribution at the few critical points, capture and define the relevant information to predict, manage, visibility and priority complex systems. They contain the “lever point phenomena” and the relevant information for decision making.

All buffers, stock, time and capacity, use Paretian models to identify lever point phenomena events to signal action, priority and opportunity.

Plan

Pareto Analysis of Stock Buffers

Parts with the greatest opportunity for a working capital reductions



Schedule

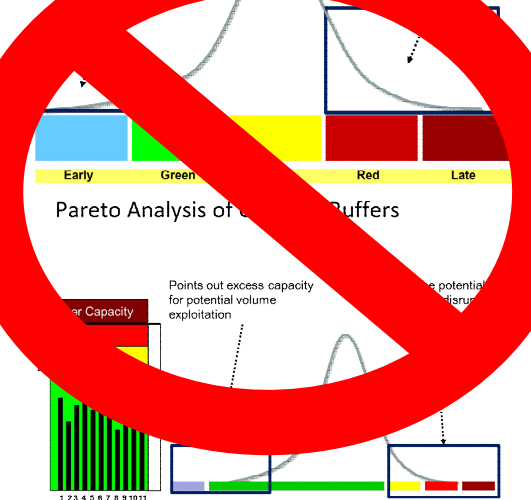
Drum Priority Capacity Load



Execute

Pareto Analysis of Time Buffers

Points out potential disruption to control point

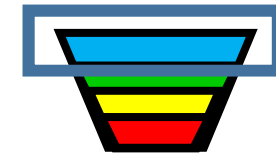


System Speed Velocity

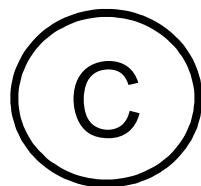
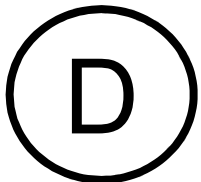
Measure status and speed of the planned work to the execution



Monitor Over the Top of Green (OTOG)



Monitor stock priority status and time buffer status determine expedite



Resource Schedule

Resource: C1 - Resource C1 (constraint) ☐ Show Only Ready To Start ☐ Show Unreleased

Filter: ☐ Constraints ☐ Non-Constraints ☒ All

Dispatch List

Ready	Work Order	Sales Order	Work Order Qty	Part	Customer	Priority	Expedite	Status	Start	End	Full Duration	Receive Qty	Start Qty	End Qty	Seq	Operation Notes
	333002-1	T3-4547	40	FPA	Alaska Airlines	5	Expedite	Released, awaiting start	2/4/2016 9:41 PM	2/5/2016 4:51 AM	7.17 hours	0	0	0	300	Mill & Bore
	393002-1	T3-4547	10	FPA	Sony Corp	7		In progress at R2	2/3/2016 1:47 PM	2/3/2016 3:57 PM	2.17 hours	0	0	0	300	Mill & Bore
	356010-8	356010	18	FPC	Alaska Airlines	4		Released, awaiting start	2/4/2016 9:25 AM	2/4/2016 1:11 PM	3.77 hours	0	0	0	300	Mill & Bore
	356009-8	356009	20	FPC	Starbucks	4		Released, awaiting start	2/4/2016 5:15 AM	2/4/2016 9:25 AM	4.17 hours	0	0	0	300	Mill & Bore
	356009-7	356009	20	FPC	Starbucks	4		Released, awaiting start	2/4/2016 1:05 AM	2/4/2016 5:15 AM	4.17 hours	0	0	0	300	Mill & Bore
	356009-6	356009	22	FPC	Starbucks	4		Released, awaiting start	2/3/2016 8:31 PM	2/4/2016 1:05 AM	4.57 hours	0	0	0	300	Mill & Bore
	55001	T1-4545	48	FPA	Boeing	5		Released, awaiting start	2/4/2016 1:11 PM	2/4/2016 9:41 PM	8.5 hours	0	0	0	300	Mill & Bore



Monitor early buffer entry

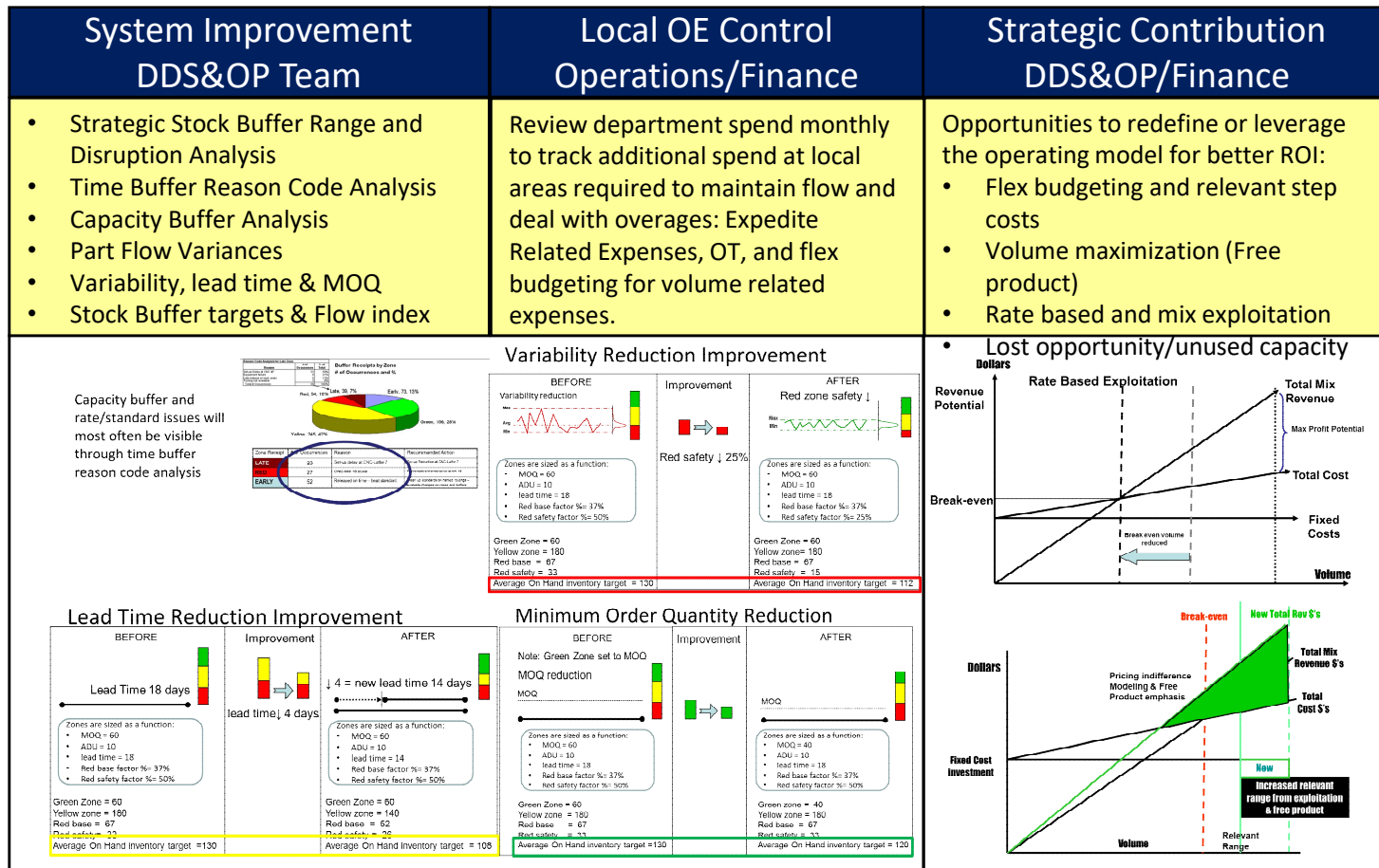
Yet to Be Received



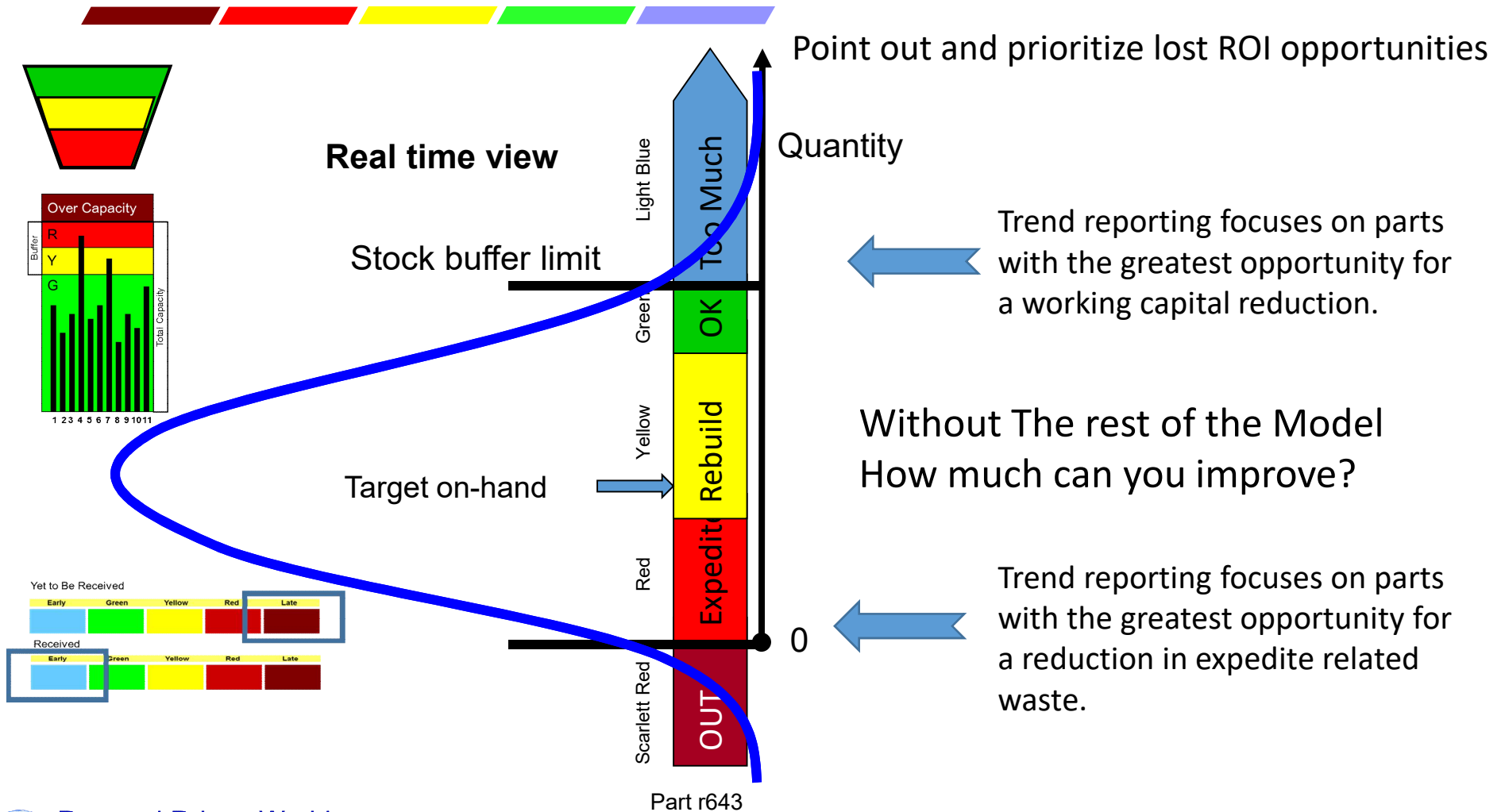
Received



Tactical and Strategic Demand Driven Dashboard



System Improvement



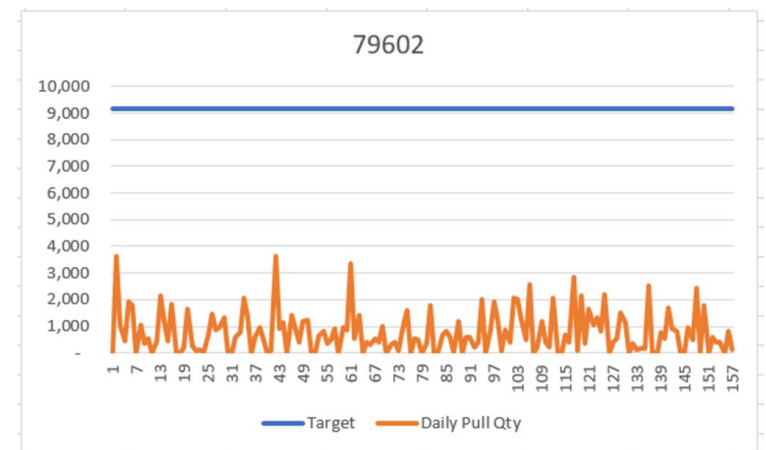
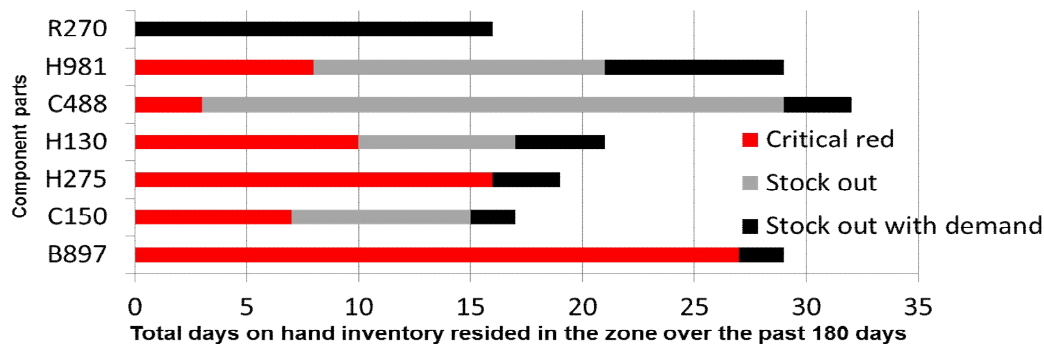
System Improvement



Point out and prioritize lost ROI opportunities



Trend critical red, stock out and stock out with demand – Parts with unacceptable service performance over the past 180 days



Is this demand variation
or supply variation?

Demand variation is
NOT the cause of the
performance issues.

DDOM System Improvement



Point out and prioritize lost ROI opportunities

Reporting:

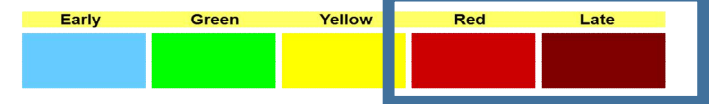
Trend the reason codes of work order penetrations into the red and late zones



Trend the reason codes for work orders for early buffer entry.



Yet to Be Received



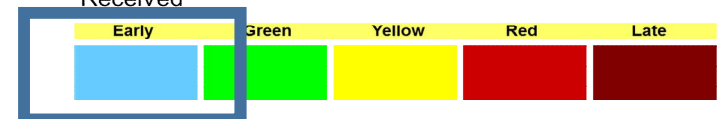
Received



Yet to Be Received



Received



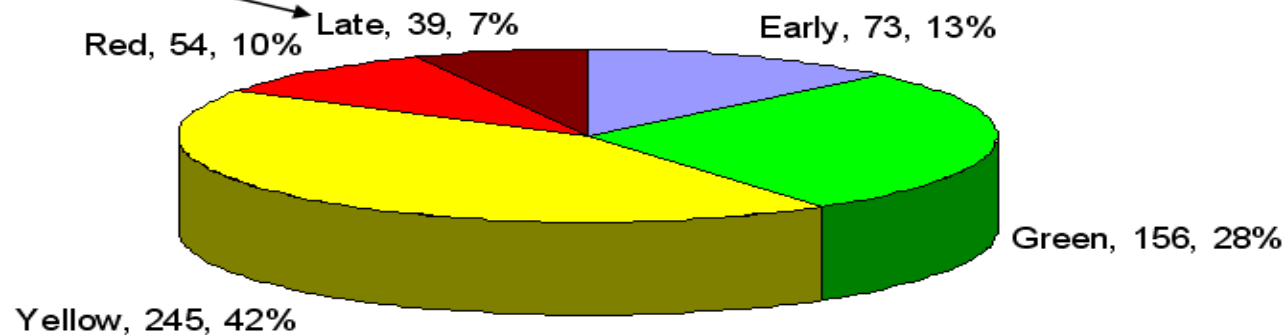
Do you have more control inside or outside of your supply chain?

4. Tactical Reconciliation

Pareto/Control Chart of Reason Codes

Reason Code Analysis for Late Zone		
Reason	# of Occurrences	% of Total
Set-up Delay at CNC #7	23	59%
Equipment failure	8	21%
Late release of work order	5	13%
Tooling not available	3	8%
Total # Occurrences	39	100%

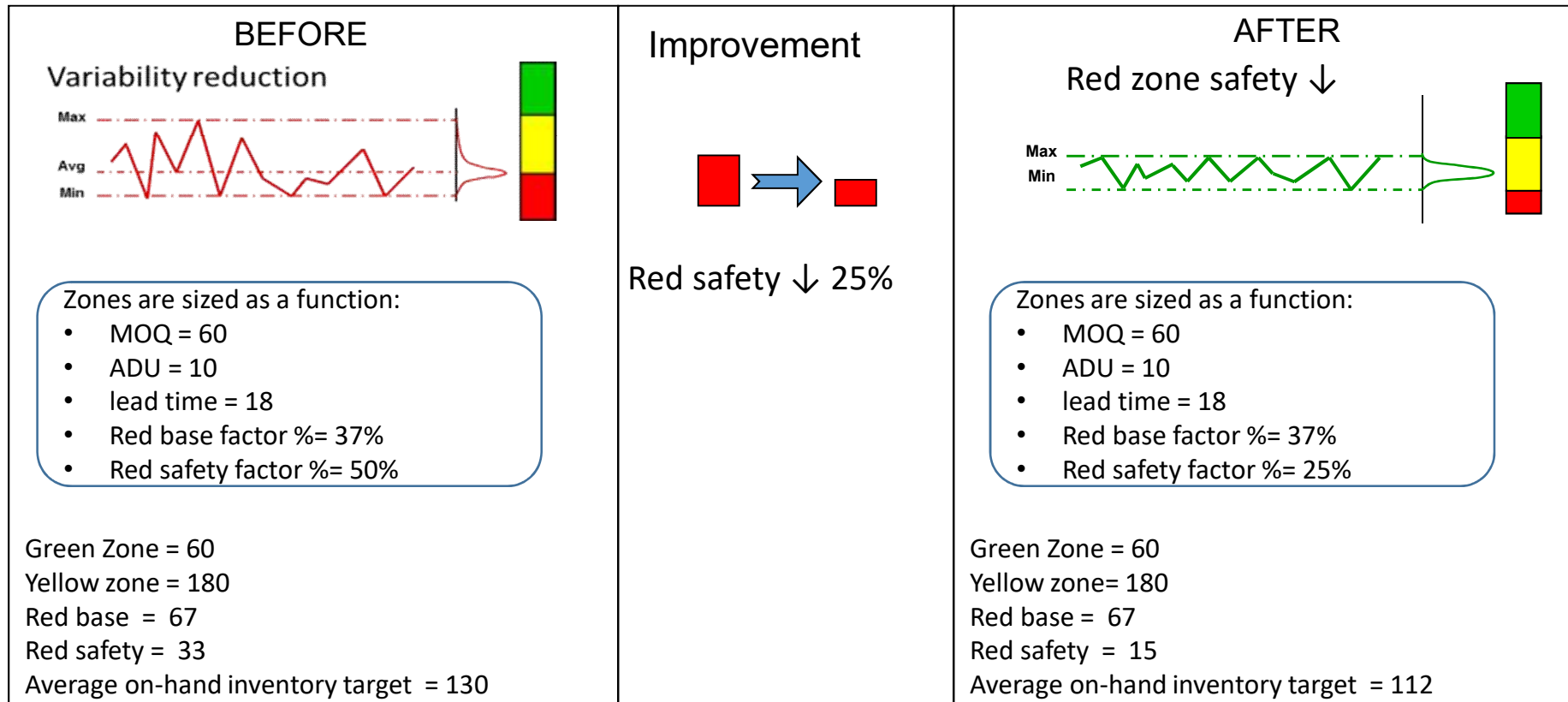
Buffer Receipts by Zone
of Occurrences and %



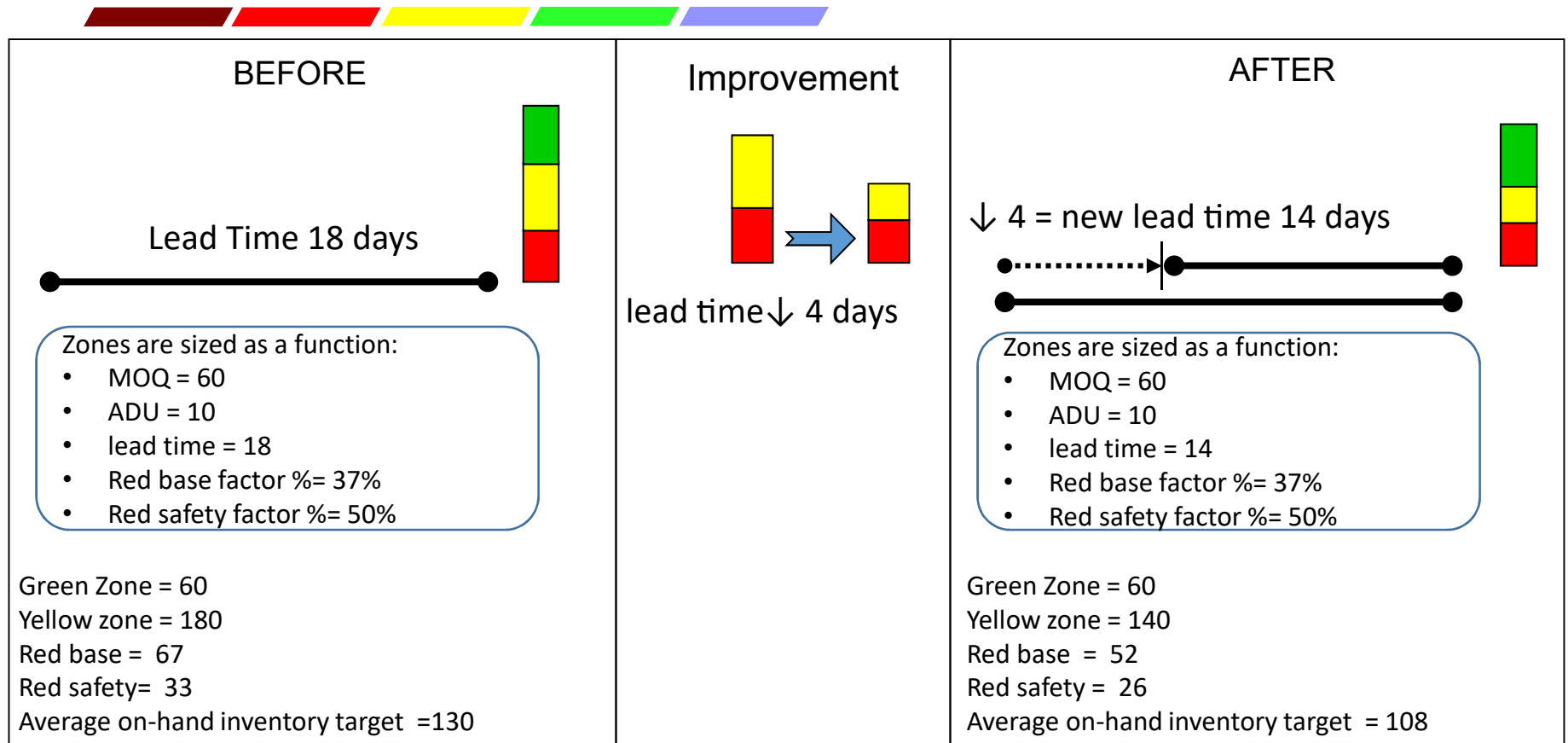
Zone Receipt	# of Occurrences	Reason	Recommended Action
LATE	23	Set-up delay at CNC-Lathe 7	Set-up Reduction at CNC-Lathe 7
RED	27	CNC-Mill 18 down	Preventative Maintenance at Mill 18
EARLY	52	Released on time – beat standard	Clean up standards on named routings – evaluate changes on ropes and buffers

Tactical reconciliation and focused action drive variation out of operations

Stock Buffer Remodel – Supply Variation



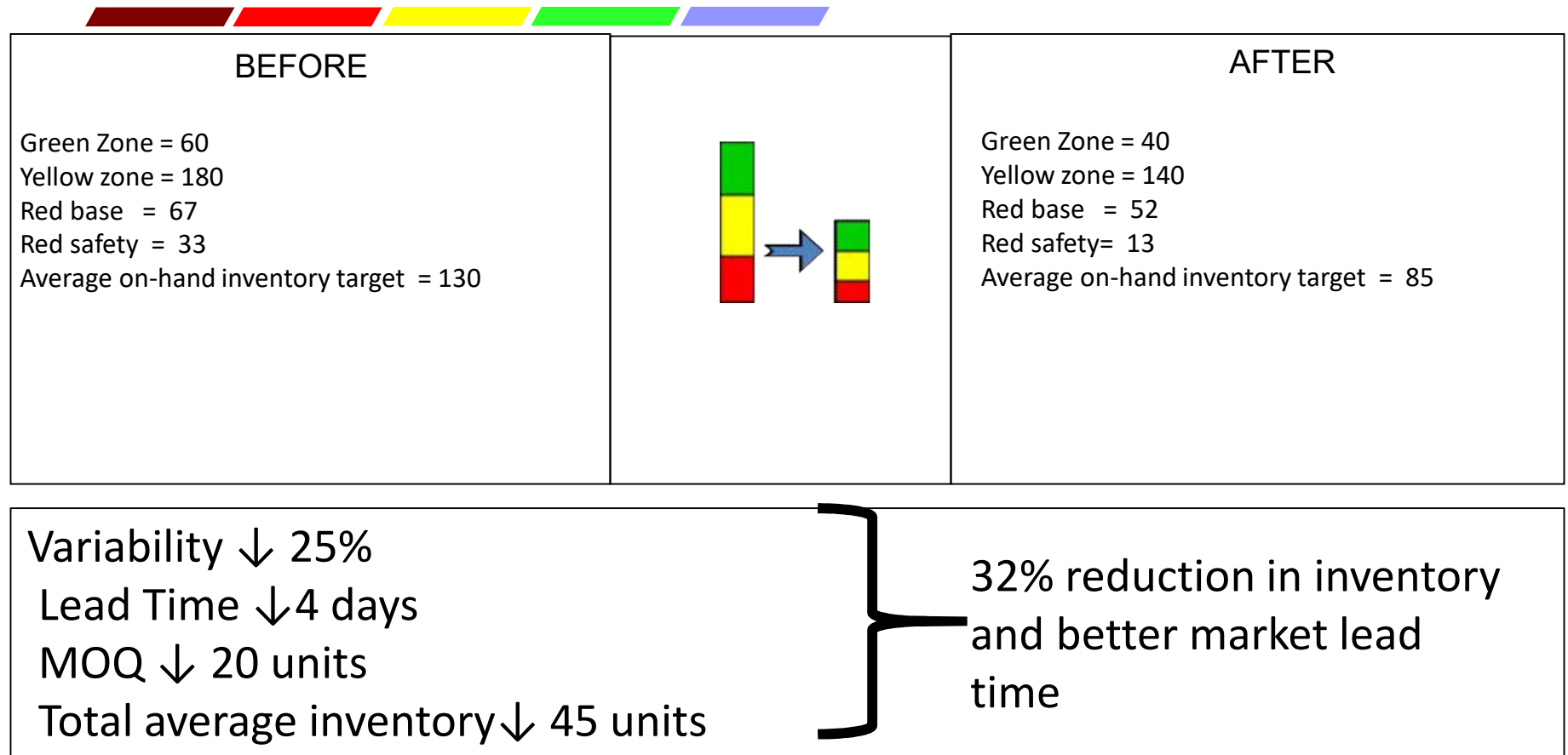
Stock Buffer Remodel - Lead Time Reduction



Stock Buffer Remodel - Minimum Order Quantity Reduction



Stock Buffer Remodel - Total of Improvements



DDAE's can do it over and over again.....

Our Approach to DDOM is Holistic



- Phases of an implementation:
 - Phase 1 Demand Driven Design Model workshop:
 - Data collection, Data Analysis, Model Building and Preparation
- Off-site 3 to 4 weeks;
 - The Working Session Outcomes – Demand Driven Model Implementation Project Map and business case for the project
- on-site 3 to 4 weeks;
 - Phase 2 Implement the project map per the scope defined in the Phase 1 workshop.
 - Phase 3 Post go-live support with System Audits to sustain the model and drive improvement.

Demand Driven Design Workshop



Phase 1 – the project map to getting started

- Off-site 3 to 4 weeks:
 - Data templates, data collection, data analysis;
 - Build the software models in DBR+™ & R®;
 - Custom education material preparation for the workshop delivery.
- On-site 3 - 5 day:
 - Day one - plant tour and confirm the data model with a small subset of the client team;
 - Day two through four – Deliver the workshop and facilitate building the project map and business case with the full team.
 - Day five – Wrap up outstanding items, present business case to executive team, assign responsibility for entry level action items and or next steps and agree on due dates to begin the implementation Phase 2.
 - Stagger DBR “go live” 1 to 3 weeks after DDMRP!

Remember Miba Yesterday?



- Design and project build in November;
- “go live” end of March;
- April and May 60% increase in orders;

Visibility to relevant priority across the DDOM and they shipped 100% - no backlog

They did it with 30% less people than they previously employed two years ago – The last time they shipped that monthly volume level.

The More Connections In Your Supply Chain - The Bigger The ROI Potential

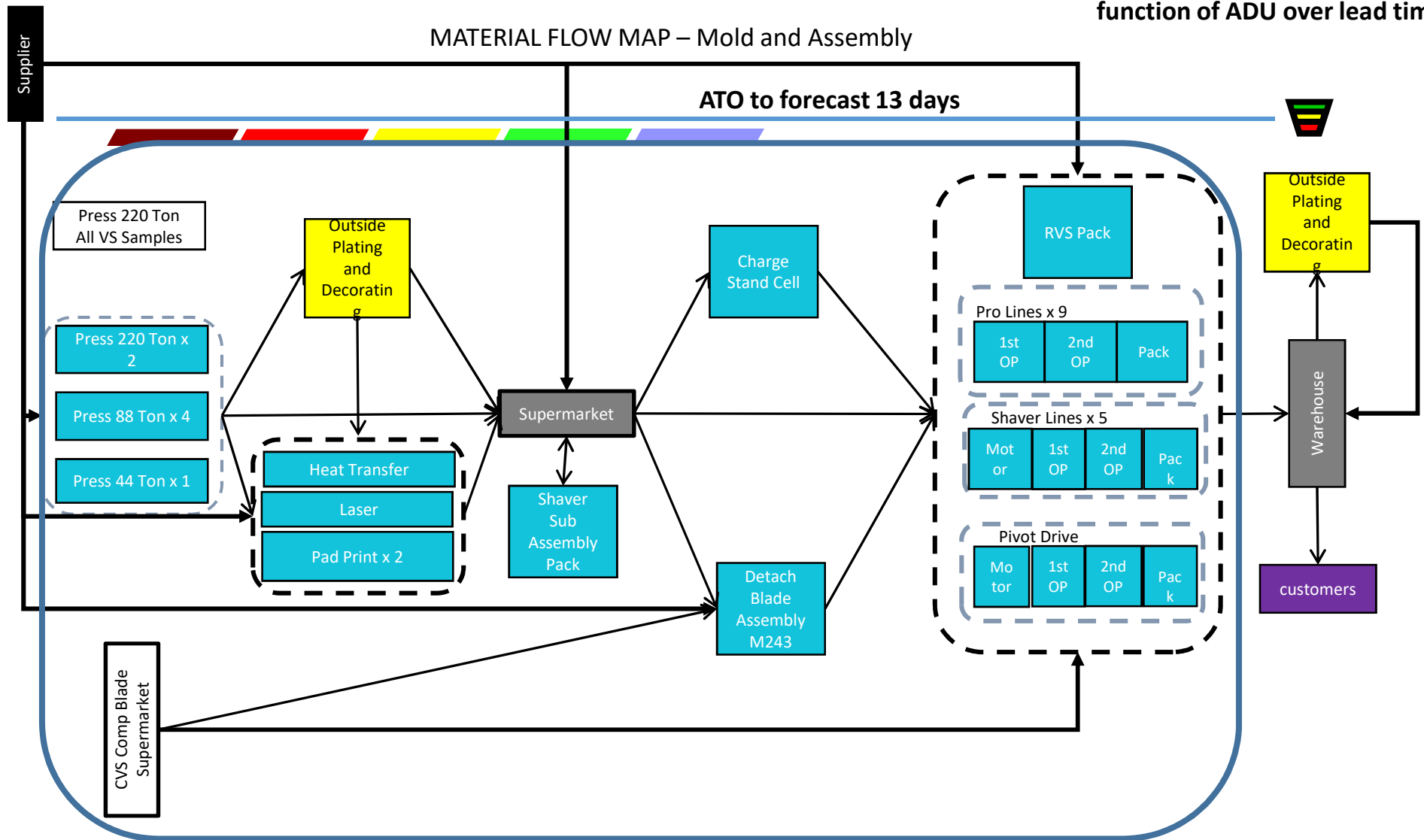


2004 to 2009:

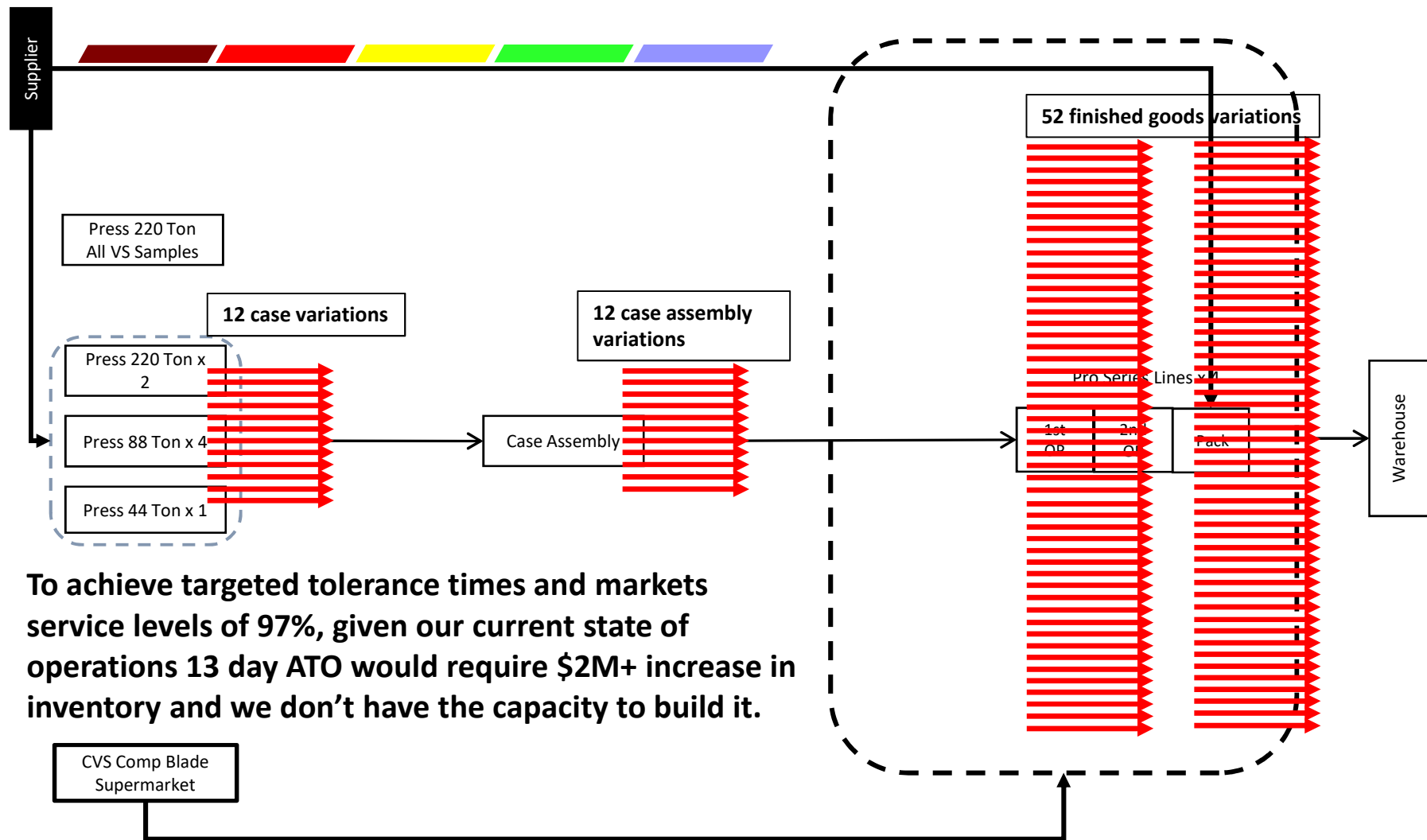
- OTD 60% to +95%
- ROI from 5 to 22%
- Lead time 24 to 10 weeks Equipment
- Lead time 27 mos. to 12 mos. Drilling Rigs
- 6 X revenue with .8 inventory increase

Questions?

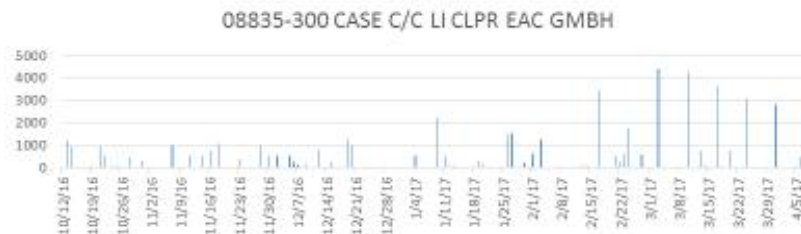
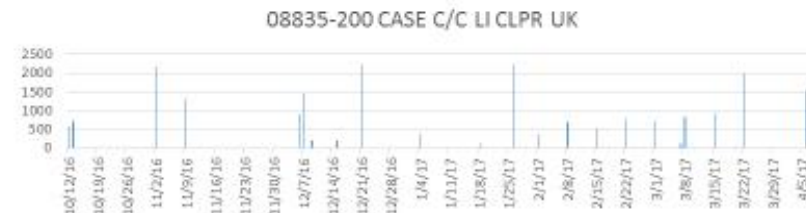
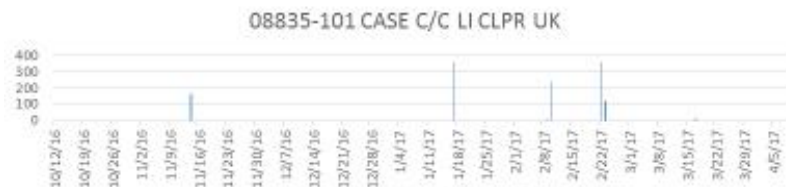
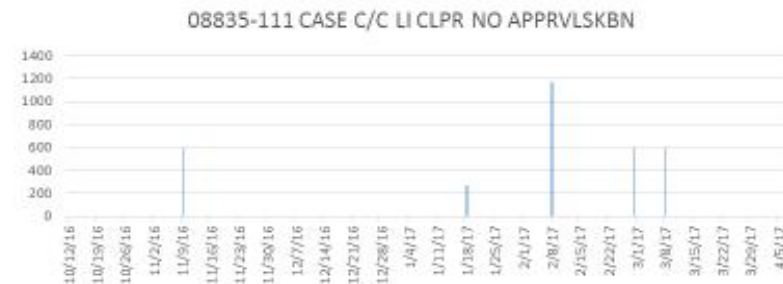
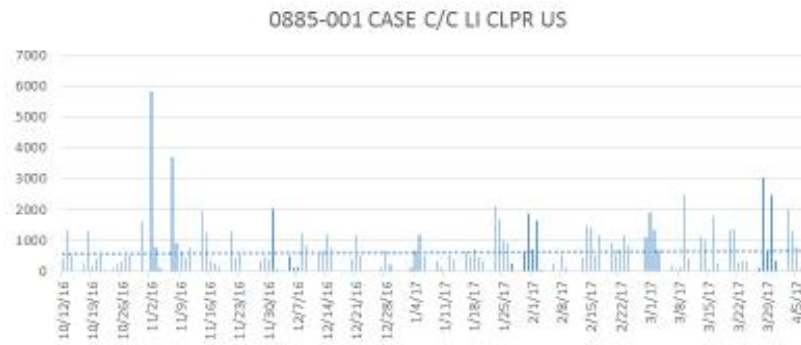
Remember inventory is a function of ADU over lead time

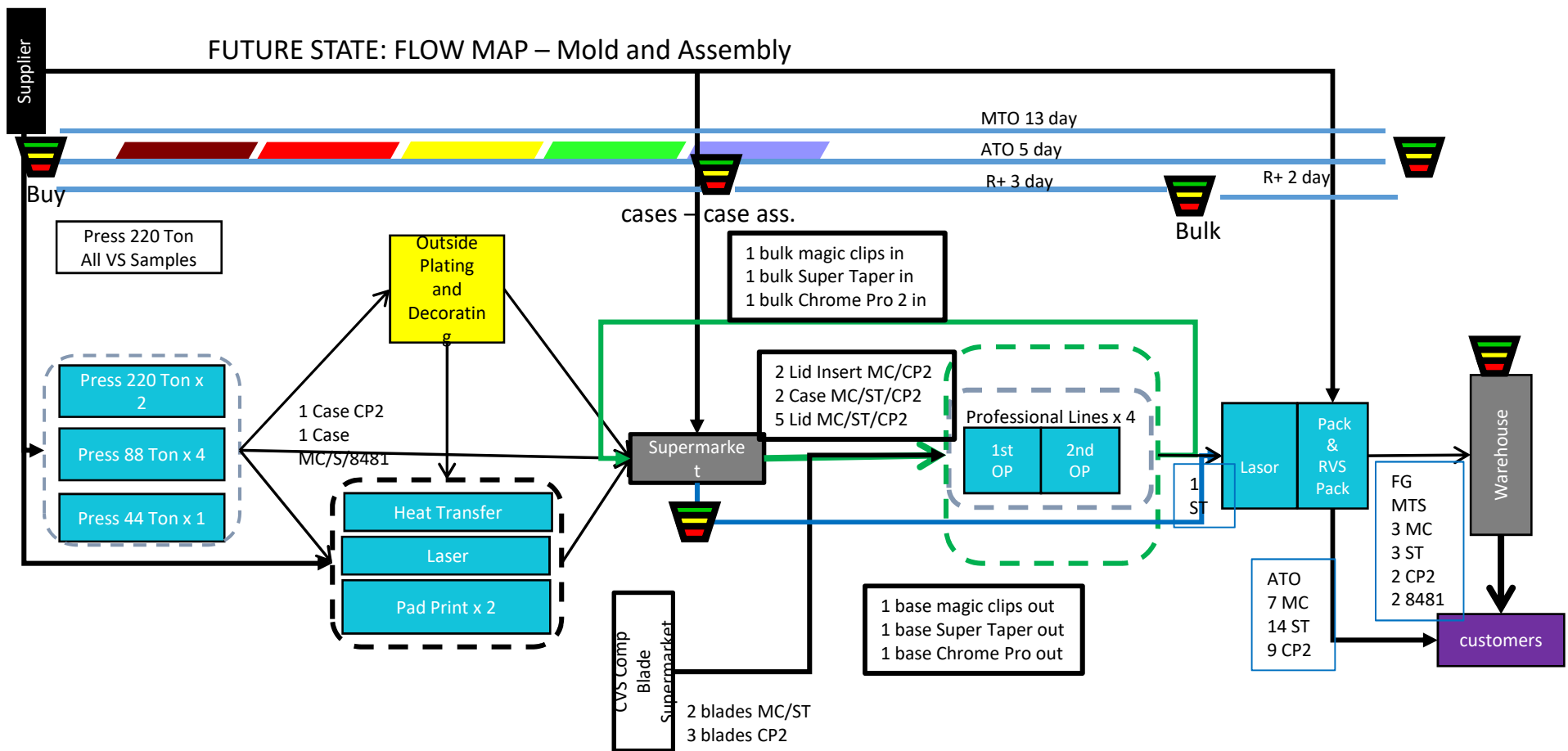


Material Flow Map – CASE Mold and Assembly



All of this Demand variation cascades from the first operation through to the finished goods!



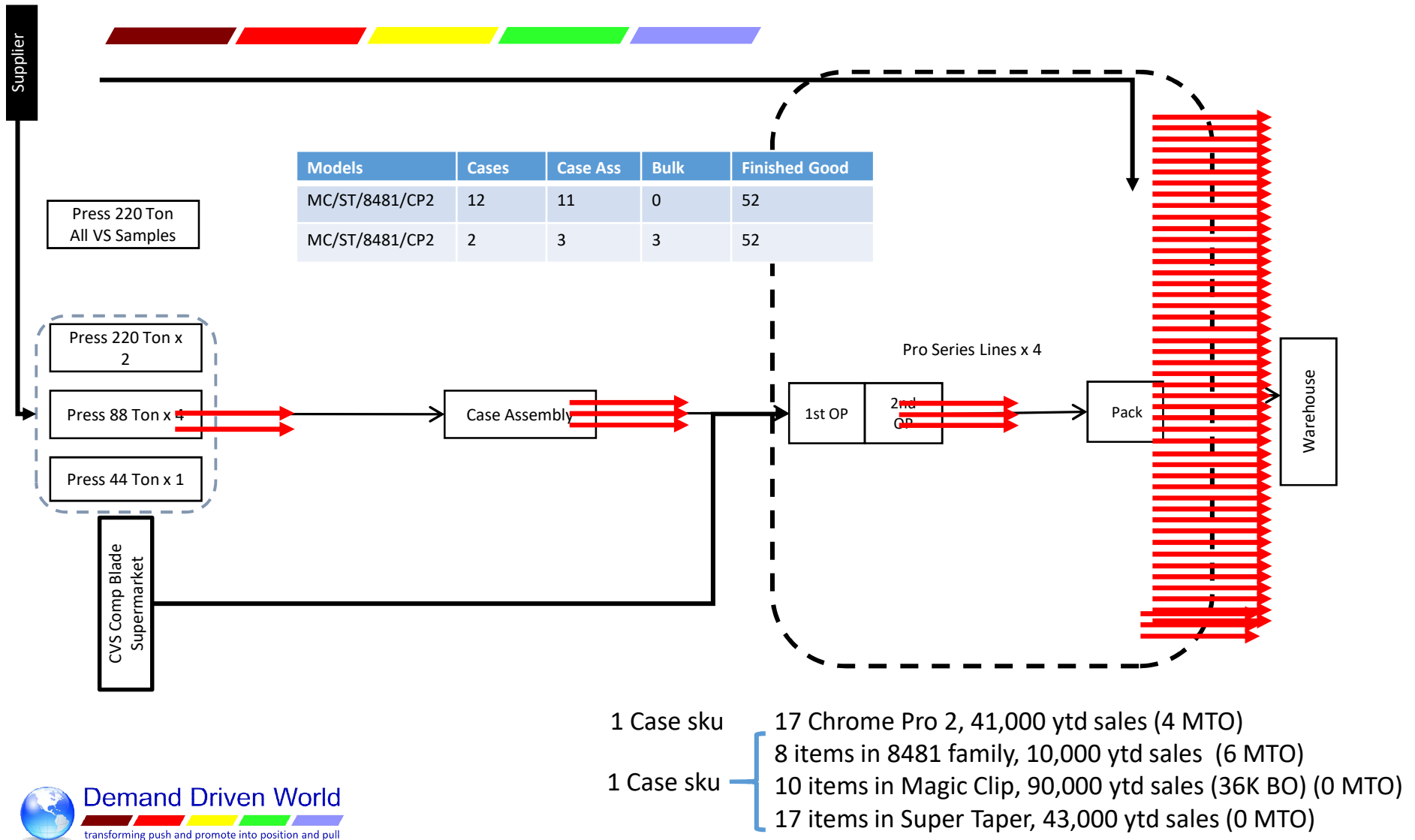


Models	Cases	Case Ass	Bulk	Finished Good
MC/ST/8481/CP2	12	11	0	52
MC/ST/8481/CP2	2	3	3	52

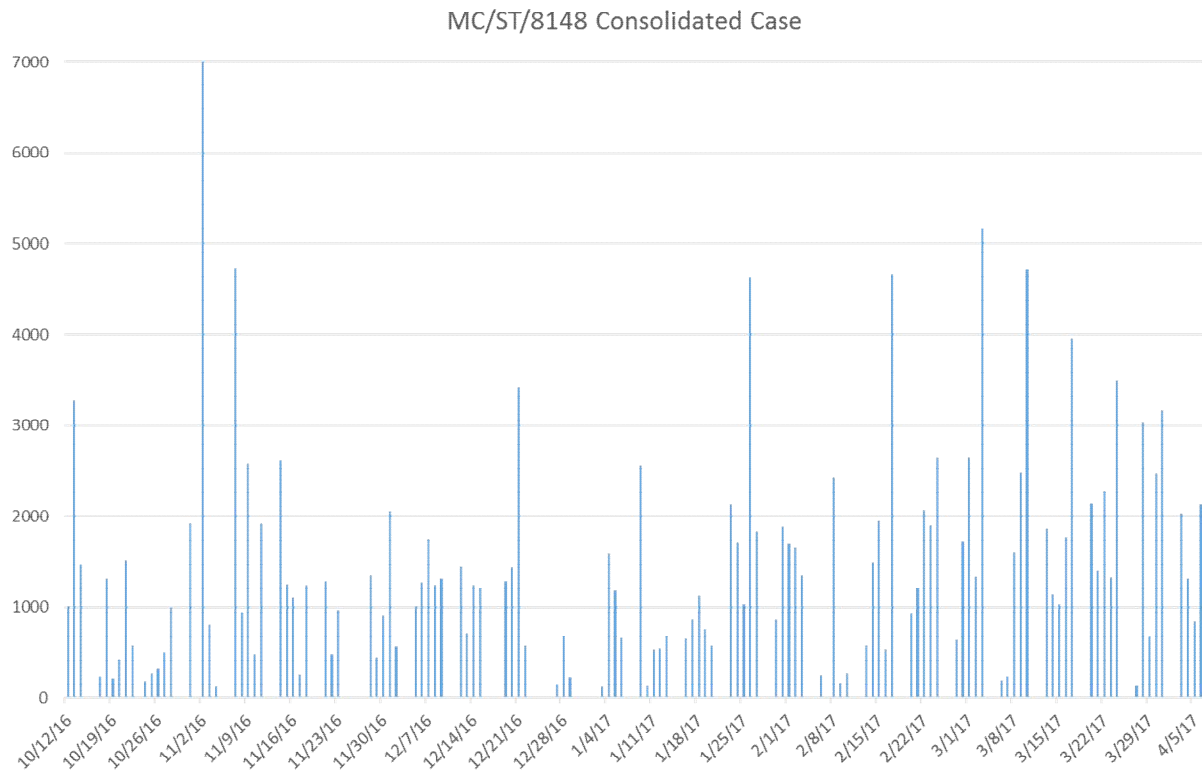
1 Case

- 17 Chrome Pro 2, 41,000 ytd sales (4 MTO)
- 8 items in 8481 family, 10,000 ytd sales (6 MTO)
- 10 items in Magic Clip, 90,000 ytd sales (36K BO) (0 MTO)
- 17 items in Super Taper, 43,000 ytd sales (0 MTO)

LINE MATERIAL FLOW MAP – CASE Mold and Assembly



Consolidated Variation is limited to laser and Pack



Unskilled sprint labor can deal with the demand variation at pack.

Future State Buffer Targets

Rotary Clipper DDMRP Replenishment Model (Magic Clip and Super Taper Examples)																									
Molded Case	Stocked	Case Assy	Stocked	New Base (Bulk) Intermediate Replenishment (4 Day Lead Time)							Rotary End Item Replenishment (3 Day Lead Time)														
				Part #	Description	EDU	90 Day Sales	Stocked	Inventory Units	Inventory \$'s	Part #	Description	EDU	90 Day Sales	Stocked	Inventory Units	Inventory \$'s								
8835-001	Y	8835-1001	Y	08148-Base	Magic Clip Base	647	58,230	Y	8,241	\$148,340	08148	5 STAR C/C MAGIC CLIP CUL US	589	53,050	Y	6,646	\$ 152,473								
8835-111	Y	8835-1201	Y	08591-Base	Super Taper Base	506	45,575	Y	6,450	\$116,101	08148-008	8591L MAGIC CLP C/C 5* WWV US	92	8,302	Y	683	\$ 18,693								
8835-200	Y	8835-1401	Y								08148-012	MAGIC CLIP C/C100-240/50-60AUS	50	4,503		-	\$ -								
8835-300	Y	8835-1601	Y								08148-016	MAGIC CLP C/C100-240 50/60EUR	287	25,830	Y	2,124	\$ 59,572								
8835-400	Y	8835-2101	Y								08148-017	MAGIC CLIP LI C/C 230V~50HZ UK	0	1		-	\$ -								
											08148-020	MAGIC CLIP C/C WWV JAPAN	3	249		-	\$ -								
											08148-026	MAGIC CLIP C/C WWV EURO/UK	15	1,389		-	\$ -								
											08148-048B	MAGICCLIP C/C BRZL WWV BULK LI	100	9,000		-	\$ -								
											08148-057	MAGIC CLIP C/C230V50HZ UK BULK	100	8,956		-	\$ -								
											08148-212	MAGIC CLIP C/C AUS BULK	-	-		-	\$ -								
No data for SP		No data for SP									08591	LI-ION DESIGNER	118	10,646	Y	1,507	\$ 33,301								
											08591-008	8591LSUPER TAPER LI C/C WWV US	16	1,421	Y	117	\$ 2,618								
											08591-012	SUPER TAPER LI C/C CLPR AUS	18	1,578		-	\$ -								
											08591-016	SUPER TAPER LI C/CEUR	247	22,270	Y	1,831	\$ 42,064								
											08591-017	SUPER TAPER LI C/C UK BULK	90	8,085		-	\$ -								
											08591-020	SUPER TAPER LI C/C WWV JAPAN	2	166		-	\$ -								
											08591-024	SUPER TAPER LI C/C INDIA	12	1,091		-	\$ -								
											08591-025	SUPER TAPER LI C/C ASIA	17	1,495		-	\$ -								
											08591-035	SUPER TAPER LI C/C CHINA BULK	56	5,049		-	\$ -								
											08591-036	SUPER TAPER LI C/C UK	32	2,858		-	\$ -								
											08591-048	SUPR TAPR LI C/C BRZL WWV BULK	17	1,562		-	\$ -								
Total Inventory									14,691	\$264,442							12,907	\$ 308,720							

Total investment is \$600,000 rather than the current inventory plus an additional \$2 million for 98% service level

Future State Gains From Holistic DDOM Strategic Design



- Break variation with intermediate stock buffers of blades, cases and bulk clippers:
 - Cases from 12 to 2 variations;
 - Case assemblies from 11 to 3 variations;
 - Bulk increased from 0 to 3 variations.
- Gain Capacity:
 - Increase assembly line capacity moving skilled labor out of packing to assembly lines;
 - Create a Laser print packing line to feed finished goods and shipping.
- Reduced Finished Goods inventory requirements (R+ lead time of 2 days rather than the current 13 days):
 - Differentiating the product at T-2days rather than T-13 days;
 - More flexibility to respond to true market demand.

Convention versus the DDAE

