Successful Planning in an Unpredictable Supply Chain

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New Pressures

- Rising forecast error
- Shorter product life cycles
- Shorter customer tolerance times
- More product and packaging complexity
- Pressure for leaner inventories
- More regulatory requirements
- SKU proliferation
- Long lead time materials

Worldwide there are more complex planning and supply scenarios than ever – the past is NOT an predictor for the future
How do you Know if Your Demand and Supply System is Broken?

Two Universal Point of Inventory

Note: “Optimal” is from an on-hand perspective
The MRP “Bi-Modal” Distribution

The Legacy Tactics – Planning Today

1. Demand input to MRP and DRP = Forecast
2. Focus on forecast accuracy improvement
3. Aggregate demand into weekly buckets
4. Dependency throughout the bill of material
5. Use Safety Stock to cover forecast error
6. Freeze production scheduling (longer than CTT)
7. Most batch decisions based on unit cost performance rather than agility
The Legacy of Our Planning Processes

✓ 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

The MRP Oscillation
Effects at Most Companies

- **Persistent Unacceptable Inventory Performance**
  - High Stocks resulting in mandated cuts or periodic refusal of inventory receipts

- **Service Level Challenges**
  - Consistent service challenges in the markets that can least afford it – the mature ones (NA and Europe)

- **High Expedite and Waste Related Expenses**
  - Premium freight in
  - Schedule break-ins
  - Unnecessary shipments to and from warehouses

Polling question

Which of the following describes your company?

a. We have persistent unacceptable inventory performance
b. We have service level challenges
c. We experience high expedite and waste related expenses
d. We have none of the above problems
e. We have more than one of the above problems
We Have a Choice

Keep Doing What We Have Always Done or...Make a Fundamental Change

Complex Supply Chains Today
Protecting Against Variability

- The accumulation and impact of variability is the enemy of flow
- Variability can be systematically minimized and managed but not eliminated
The Effects of Variability – Supply Chain

**The more parts – the worse the effect!**

**Bull-Whip Effect:** “An extreme change in the supply position upstream in a supply chain generated by a small change in demand downstream in the supply chain. Inventory can quickly move from being backordered to being excess. This is caused by the serial nature of communicating orders up the chain with the inherent transportation delays of moving product down the chain.” (APICS Dictionary, 12th Edition)

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The Effects of Variability - Planning

**Nervousness:** “The characteristic in an MRP system when minor changes in higher level (e.g. level 0 or 1) records or the master production schedule cause significant timing or quantity changes in lower level (e.g. 5 or 6) schedules or orders.” (APICS Dictionary 12th Edition, Blackstone, 86)
Sources of Variability

- Management Variability
- Supply Variability
- Operational Variability
- Demand Variability

Organizational Output

Mitigating Variability

- Stop variation from being passed
- First “decoupling” the wave
- Then “buffer” the “decoupling point”
3 Types of Buffers to Combat Variation

- Stock
- Time
- Capacity

Where to Focus First – Capacity or Materials?

- World capacity now exceeds demand
- Highly efficient resources without materials are idle resources
- Highly efficient resources with the wrong materials build unnecessary inventory
- Material synchronization issue is now primary
The Effects of Stock Buffering

What does being Demand Driven mean?

- Does not mean
  - Make to order everything
  - Simple pull
  - Inventory everywhere

- Does mean
  - Sensing changing customer demand, then adapting planning and production while pulling from suppliers – all in real time!
### What is Demand Driven MRP?

A multi-echelon materials and inventory planning and execution solution that enables a company to become demand driven.

- **Demand Driven MRP (DDMRP)**

### DDMRP Key Solution Component Summary

<table>
<thead>
<tr>
<th>Demand Driven MRP (DDMRP Critical Components)</th>
<th>Description</th>
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<tr>
<td>5 Zone Buffers</td>
<td>Provides easy status and relative priority visibility for planning and execution at all levels</td>
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<tr>
<td>Dynamically Adjusted Buffers</td>
<td>&quot;Flexes&quot; buffer positions based on changes to consumption</td>
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<tr>
<td>Planned Adjustments to Buffers</td>
<td>Accounts for seasonality, product introduction/deletion/transition</td>
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<tr>
<td>Globally Managed Buffer Profiles</td>
<td>Parts/SKU are grouped by like attributes for ease of management</td>
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<td>Decoupled BOM Explosion</td>
<td>Creates a unique blend of dependence and independence for planning</td>
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<tr>
<td>ASR Lead Time Calculation</td>
<td>Lead time determination based on the BOM's longest unprotected sequence</td>
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<tr>
<td>Order Spike Protection</td>
<td>Highlights and accounts for problematic sales orders based on a threshold and horizon</td>
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<tr>
<td>Material Synchronization Alert</td>
<td>Identifies specific misalignments between child supply and parent demand</td>
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<tr>
<td>Multi-Location Buffer Status Visibility</td>
<td>Relative status visibility across a distribution net for like parts/SKU</td>
</tr>
<tr>
<td>Lead Time Managed Parts</td>
<td>Managing critical non-stocked items through timed alert zone</td>
</tr>
<tr>
<td>Matrix BOM + ASR Lead Time Analytics</td>
<td>A revolutionary lead time and working capital compression approach across all BOMs</td>
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The Five Components of DDMRP

Demand Driven Material Requirements Planning

<table>
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<tr>
<th>Strategic Inventory Positioning</th>
<th>Buffer Profiles and Levels</th>
<th>Dynamic Adjustments</th>
<th>Demand Driven Planning</th>
<th>Visible and Collaborative Execution</th>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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- Modeling/Re-modeling the Environment
- Plan
- Execute

Before Demand Driven – FMCG Example

- Purchase Orders
- Raw Pack
- Mix Room
- Pack
- DC
- DC
- DC
- DC

- Planned Orders (MRP)
- Manufacturing Orders
- Expedites/Schedule Break-ins

50+ Days
Immediate Results for Materials - FMCG

300 Materials are buffered without increase in RPW inventory. Lead-times decoupled

Before

3-Medium
4-Low
5-Over ToG

Dampened the bull whip, now operating more effectively, and inventory optimized

After

Replenishment lead time has been reduced 82% to 9 days from 50 days

Raw and pack inventory down 17%

Finished good inventory down 45%

99.7% customer service

Summary

Bottom Line Benefits
Without Tradeoffs

New Operational Equation
Elements and Emphasis

Fundamental Planning
Changes

Fundamental Principal

DDMRP

High Service
Lower Inventory
Fewer Expedites

Lead Time
Buffer Status
Order Minimums

Sales Orders
Decoupling Points

FLOW

ROCE ▲

ROCE, reduction and enhancements changes for a more sustainable and competitive global landscape
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Carol Ptak is the co-author of the third edition of Orlicky’s Material Requirements Planning and a partner at the Demand Driven Institute. Previously, Carol was at Pacific Lutheran University as Visiting Professor and Distinguished Executive in Residence after years of executive management experience at PeopleSoft and IBM Corporation. Ptak served as the vice president and global industry executive for manufacturing and distribution industries at PeopleSoft. Carol is a past APICS President and CEO.