



**Best Practices In Managing Tactical and
Operational Risk and Uncertainty across all
Functions of the Supply Chain**

November 17, 2009

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Outline

***“Best Practices In Managing Tactical and
Operational Risk and Uncertainty across all
Functions of the Supply Chain”***

- **Overview**
 - Sources of tactical and operational uncertainty in the supply chain
- **Area of focus: Self-inflicted internal uncertainty**
 - Living with multiple plans in your own corporation
 - Trade-off between desired customer service levels vs. inventory investment

Overview

- *Weather events*
- *Persistent Power outages*
- *Geopolitical risk*
- *Labor and equipment disruptions*
- *New technology introduction*



Some companies discuss and have plans in preparation for some of these “catastrophic” events...

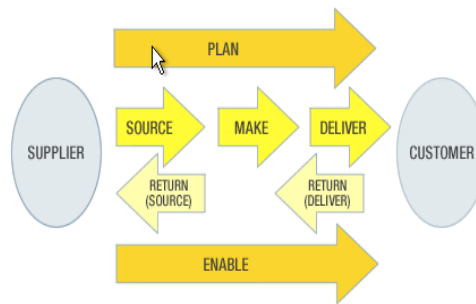
These issues dominate press coverage and focus. What about the more mundane AND likely tactical sources?

Overview

Key sources of tactical uncertainty in the Supply Chain: External

SCOR® Supply Chain Council

- *Supplier delivery*
 - *Average OTD*
 - *Time variance*
- *Delivered quality*
- *Commodity volatility*
- *Allocations*
- *Financial distress*
- *FOREX*



- *Demand uncertainty*
- *Returns and warranty*
- *Changing customer expectations (planned and unplanned)*
- *Competitor activities*
- *Customs time*
- *FOREX*

What can be done about these?

Overview

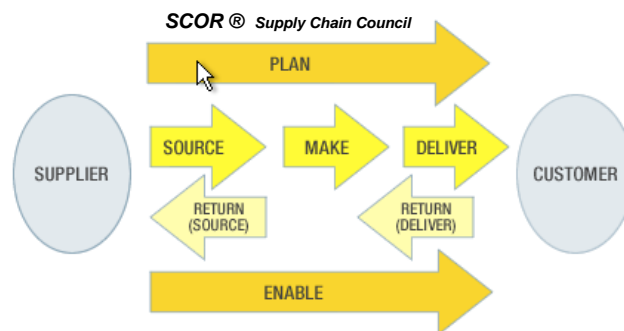
- **Real customer and supplier collaboration**
 - Share key planning data (inventory, downstream demand, planning parameters and forecasts),
 - establish agreed upon policies and business rules, and
 - share forward looking information across the planning horizon
- **Match commercial approach from front-end to back-end (balanced risk)**
- **Supplier development**
- **Second / double source key items**
- **Tactical hedging**

All these are great but...

- **We depend on external organizations and factors for our success**
- **Can we really take advantage of the initiatives if we are not internally ready?**

Overview

Key sources of tactical uncertainty in the Supply Chain: Internal



Multiple plans running across the company:

- **Demand**
- **Distribution**
- **Production**
- **Procurement**

Service level and inventory trade-off

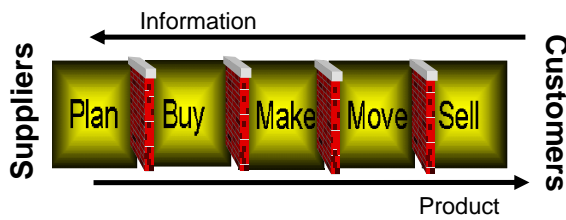
- **What service? For what parts?**
- **What is good inventory?**

Living with multiple plans in your own company...

Even with ERP systems, EDI and other systems, multiple plans are followed by different teams in the organization...

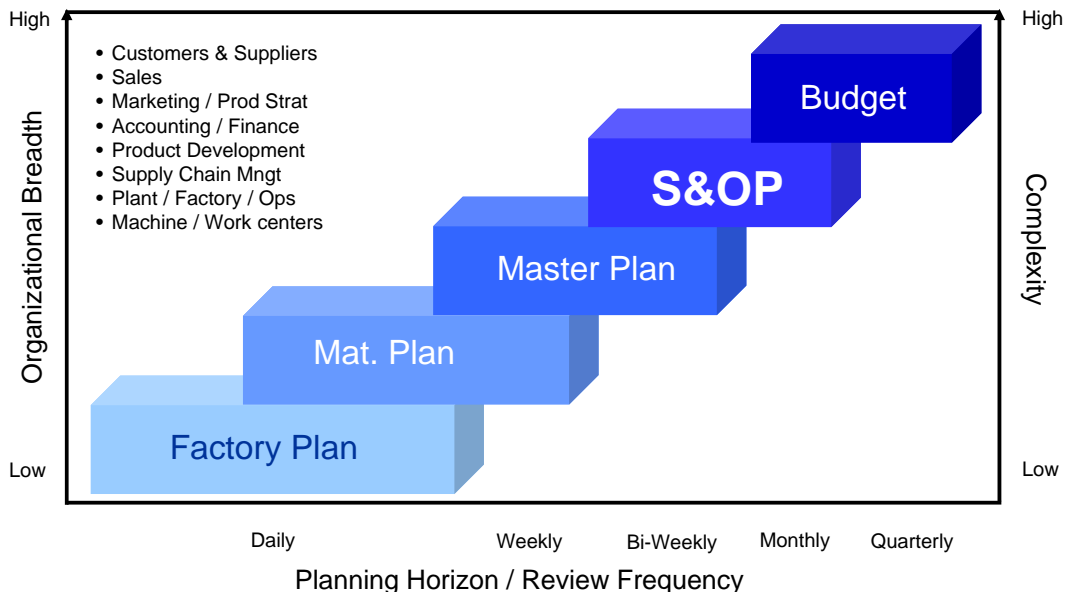
- Demand Plan
- Distribution
- Production
- Procurement

This uncertainty makes production people "forecast" demand, and procurement "forecasts" production !!!

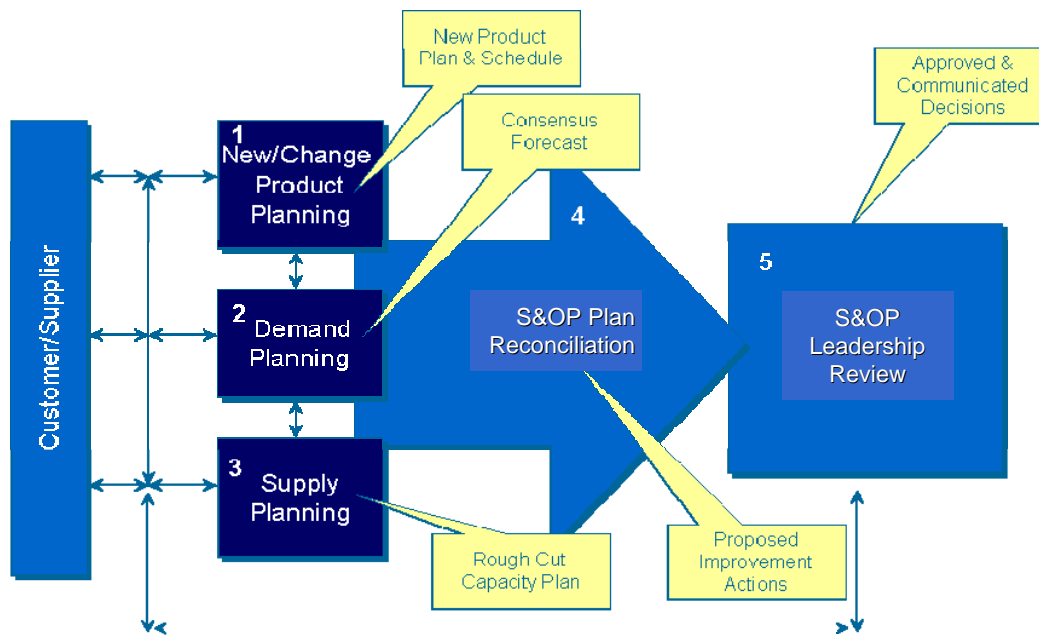


- Functional silos and competing goals
- Lack of accountability
- Reactive behavior
- Sub optimizing results (shifting cost, one month is productivity, the next is service, inventory and so forth)

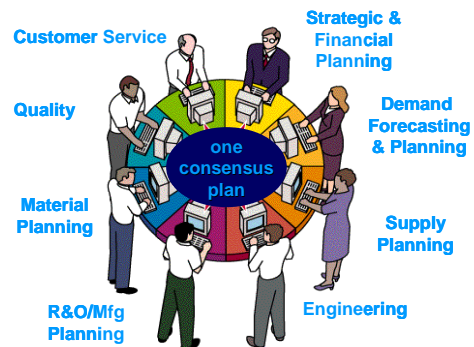
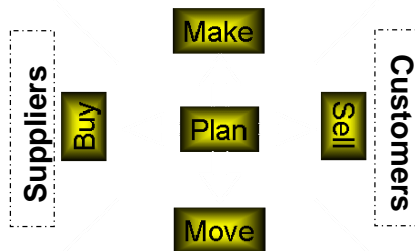
Planning in the integrated supply chain spans all key stakeholders



Five Step S&OP Process



With an effective S&OP Process... The business is managed as an integrated supply chain



- Collaborative and cross functional
- Defined ownership & organizational alignment
- Sharing knowledge and data
- Closed loop processes
- Aligned measures to the profit plan
- Proactive adjustments & event management

Service Level and Inventory Trade-off

Does your company go from inventory to productivity to service initiatives and conference calls from one period to the next?

*This is a clear sign of internally created uncertainty in regards to the lack of an effective and sustainable **service and inventory optimization process***

Closed-loop Inventory and Service Optimization Process

- ➡ 1. Segment Items
- 2. Align Goals and Strategy
- 3. Develop a Business Case
- 4. Review the Planning Decisions

Step 2. Align Goals and Strategy: Business Rules and Targets

Business rules and assumptions must be developed for key dimensions specific to your business that affect the service and optimization process:

- *Thresholds for part categorization values (for example: velocity, cost, size, seasonality)*
- *Multi-echelon stocking policies*
- *Cost of holding inventory*
- *Fixed transaction costs*
- *Transportation or space constraints*
- *Item criticality*
- *Customer lead time expectations*

Business targets are the measure of success running the business. They need to be well understood to drive the optimization engines and to focus the activities of the planning team:

- *Service Level targets by category*
- *Inventory days/turns*
- *Gross Margin Return on Inventory (GMROI)*
- *Logistics productivity (number of transactions, effect of lot sizing)*

The InvOpt Process

1. Segment Items

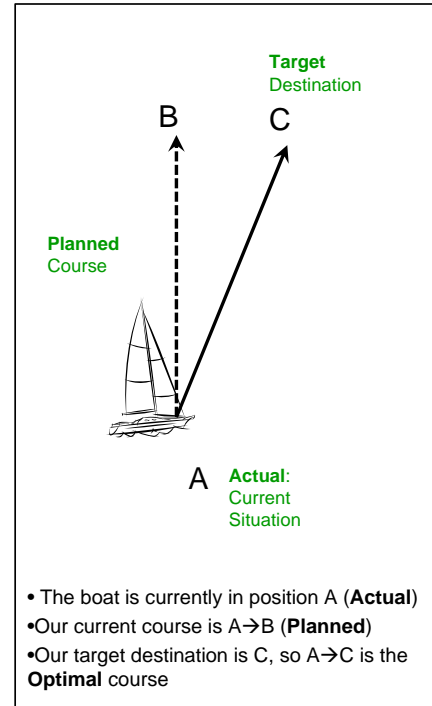
2. Align Goals and Strategy

 3. Develop a Business Case

4. Review the Planning Decisions

Actual vs. Planned vs. Target Inventories

- **Actual Inventory** = Quantity on hand * Unit cost
- **Planned Inventory** = Average quantity of inventory the company should have on hand derived from the current parameters in your system
 - Average Inventory = $\frac{1}{2}$ (Lot Size) + Safety Stock
- **Target Inventory** = Average inventory if the planning parameters were optimized to achieve your target service level:
 - Lot Size = F(Fixed transaction cost, holding cost)
 - Safety Stock = G(Lead time, lotsize, uncertainty, service)
with the current supply chain attributes: lead times, supplier performance, warehouse capacity



The InvOpt Process

1. Segment Items
2. Align Goals and Strategy
3. Develop a Business Case
- ➡ 4. Review the Planning Decisions and Execute New Plan

Example: A Business Case

Business Case by ABC, Velocity

Drop Filter Fields Here

statAnnualCOGS ActualOnHand\$ PlannedOnHand\$ TargetOnHand\$ Counter

Drop Column Fields Here

ItemABC ItemVelocity

		Grand Total				
		statAnnualCOGS	ActualOnHand\$	PlannedOnHand\$	TargetOnHand\$	Counter
⊞ A		\$279,770	\$27,482	\$25,037	\$31,455	78
⊞ B		\$728,001	\$168,053	\$75,431	\$112,527	170
⊞ C		\$1,085,337	\$336,774	\$226,104	\$190,725	174
⊞ D	FAST	\$388,084	\$92,927	\$55,476	\$74,845	11
	INACTIVE	\$0	\$6,590	\$1,295	\$1,295	5
	MODERATE	\$482,906	\$173,395	\$88,344	\$174,570	25
	SLOW	\$264,008	\$175,097	\$157,713	\$159,568	65
D Total		\$1,134,998	\$448,008	\$302,827	\$410,278	106
⊞ E		\$251,807	\$74,171	\$132,289	\$117,730	488
Grand Total		\$3,479,913	\$1,054,489	\$761,689	\$862,714	1,016

Example B: Review Process and Prioritized Actions

Product ID: P1390 Location ID: 1010 Business Case Summary

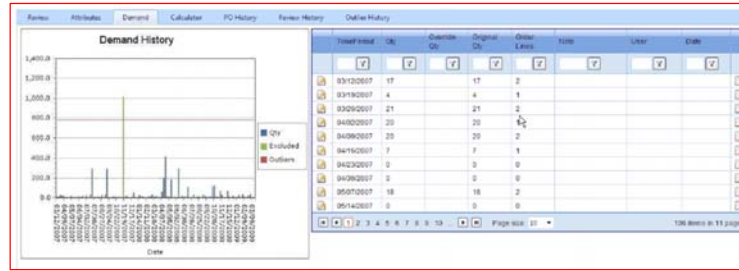
Accept All Deline All Finish Review Revise Review

Review Type	Old Value	New Value	Review Action	Override Value	Note	Reviewed
Lot size	6	24	Accept			
Safety stock	12	14	Accept			

Demand History (Monthly)

	Actual	Planned	Target	Difference
Service				
Service level %	100.0 %	95.5 %	98.0 %	2.5 %
Avg customer delay (days)		0.3	0.2	
Inventory				
Inventory on hand qty	14.0	15.0	26.0	11.0
Inventory on order qty	18			
Avg inventory \$	\$333	\$356	\$618	\$261
Annual cogs \$	\$8,245			
\$ per order line (minimize)				\$1.06
Weeks of supply	2.1	2.2	3.9	1.6
Inventory turns	24.8	23.1	13.3	-9.8
Changes to trigger order	0			
Parameters				
Forecast (monthly)		24		
Lead time (weeks)	2.1	2.5		
Lot size	7	6	24	18
Safety stock		12	14	2

Example C: Decision Supporting Tools and Reports



Demand Outlier Management

Attributes

Review	Attributes	Demand	Calculator	PO History	Review History	Outlier History
Basic						
Location						
Item		4HC00				
Desc		WASTEBASKET 28 1/8 QT				
ABC		A				
Stocked						
Prod Item						
Unit cost		\$1.95				
Unit price		\$8.21				
Unit margin		\$6.25				
Annual coqs		\$2,801				
Cubic feet		1.3				
Effective holding cost		257 %				
Planning Strategy						
Item cost		VERY-CHEAP				
Item velocity		SUPERFAST				
Item space		FILFIE				
Target service level		99.00 %				
Action & Alerts						
Action		Review				
Planning alert		Under%				
Investment alert		Invest				
Space alert		IncCube				
Demand Statistics						
Avg demand weekly: 28.61						
Std dev demand weekly: 67.92						
Annual quantity: 1,488						
Num order lines: 135						
Num weeks with activity: 74						
Fraction unplanned demand: 0.10						
Auto outlier threshold: 775						
Num outliers: 0						
Avg demand (unfiltered): 38.30						
Std dev demand (unfiltered): 117.67						
Supply Statistics						
Num supply orders: 22						
Supply on time delivery: 83.0 %						
Avg lead time (weeks): 1.7						
Avg order quantity: 130.5						
Review Statistics						
Num reviews:						
Last review date:						
Last review by:						
Next review date:						
Eligible for review:						
Review status:						

What-if calculators

Review	Attributes	Demand	Calculator
Quick Calculator			
Avg Demand		<input type="text" value="28.61"/>	
Std Dev Demand		<input type="text" value="67.92"/>	
Lead Time		<input type="text" value="2.1"/>	
Lot Size		<input type="text" value="1.20"/>	
<input type="radio"/> Reorder Point <input checked="" type="radio"/> Safety Stock			
Safety Stock:	<input type="text" value="56"/>		94.51%
Target Service %	<input type="text" value="0.99"/>		261
<input type="button" value="Calculate"/>			
<input type="button" value="Button"/>			

For more information contact us at:

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And join our "Inventory Optimization" group at LinkedIn