ON-TIME DELIVERY....REALLY?
MANAGED RESOURCES ...SERIOUSLY?
S&OP.... GET REAL!

By Timothy Winder

Technical Change Associates, Inc.

SALES & OPERATIONS PLANNING (S&OP)

A Lean, compatible approach to flawlessly managing your resources

Sales & Operations Planning (S&OP) allows manufacturers to know when supply and demand are properly balanced. When implemented properly, costs are lowest, on-time shipments are highest and inventories are most strategically deployed.

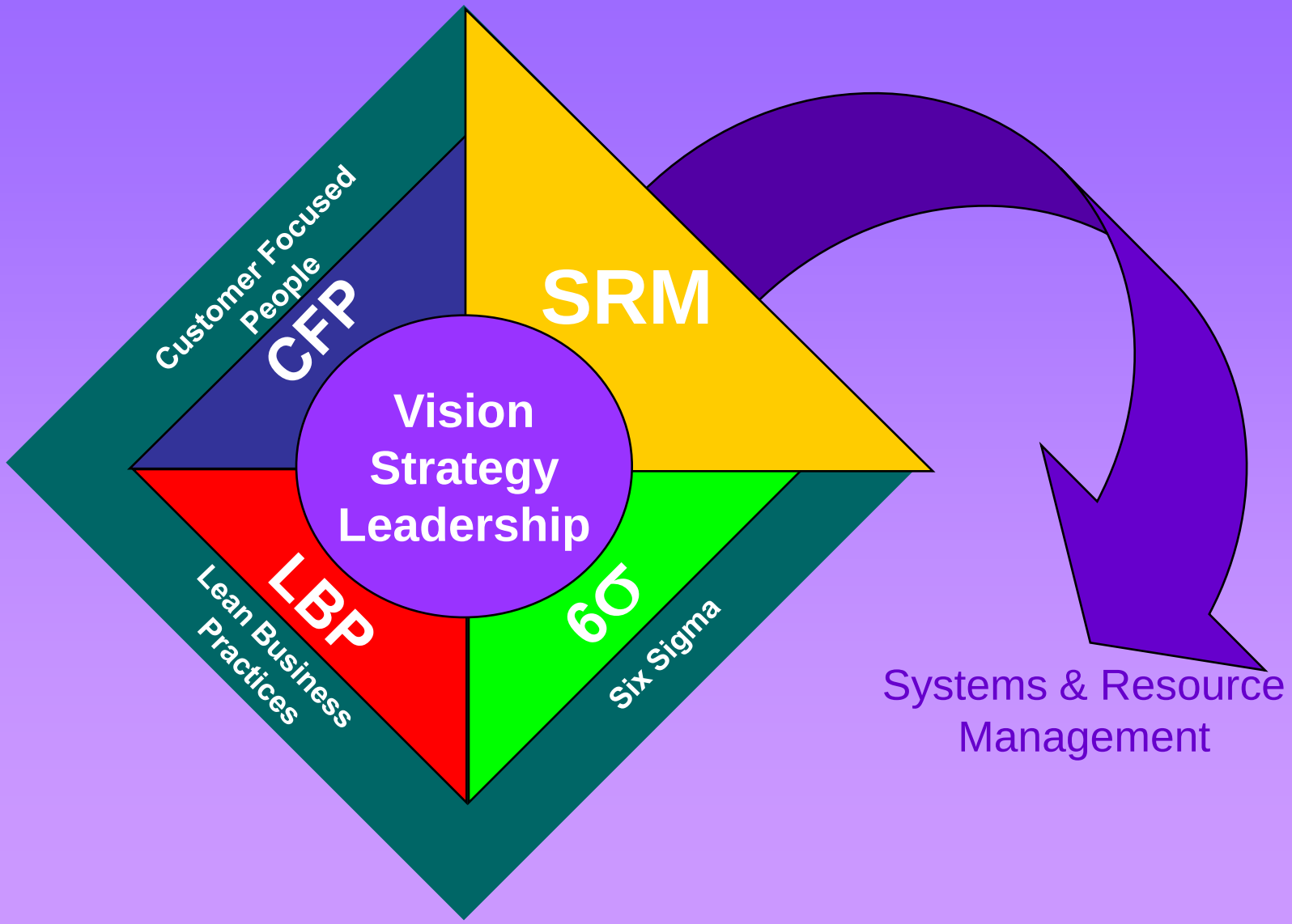
S&OP *allows manufacturers to make timely resource decisions. When management of all areas (sales, manufacturing and finance) understand how S&OP works, your organization can work together to provide the best customer service for the lowest costs. Understanding S&OP also unifies all senior managers allowing communication throughout the organization. When everyone knows what is going on everyone can contribute to the success!*

Timothy Winder, CPIM

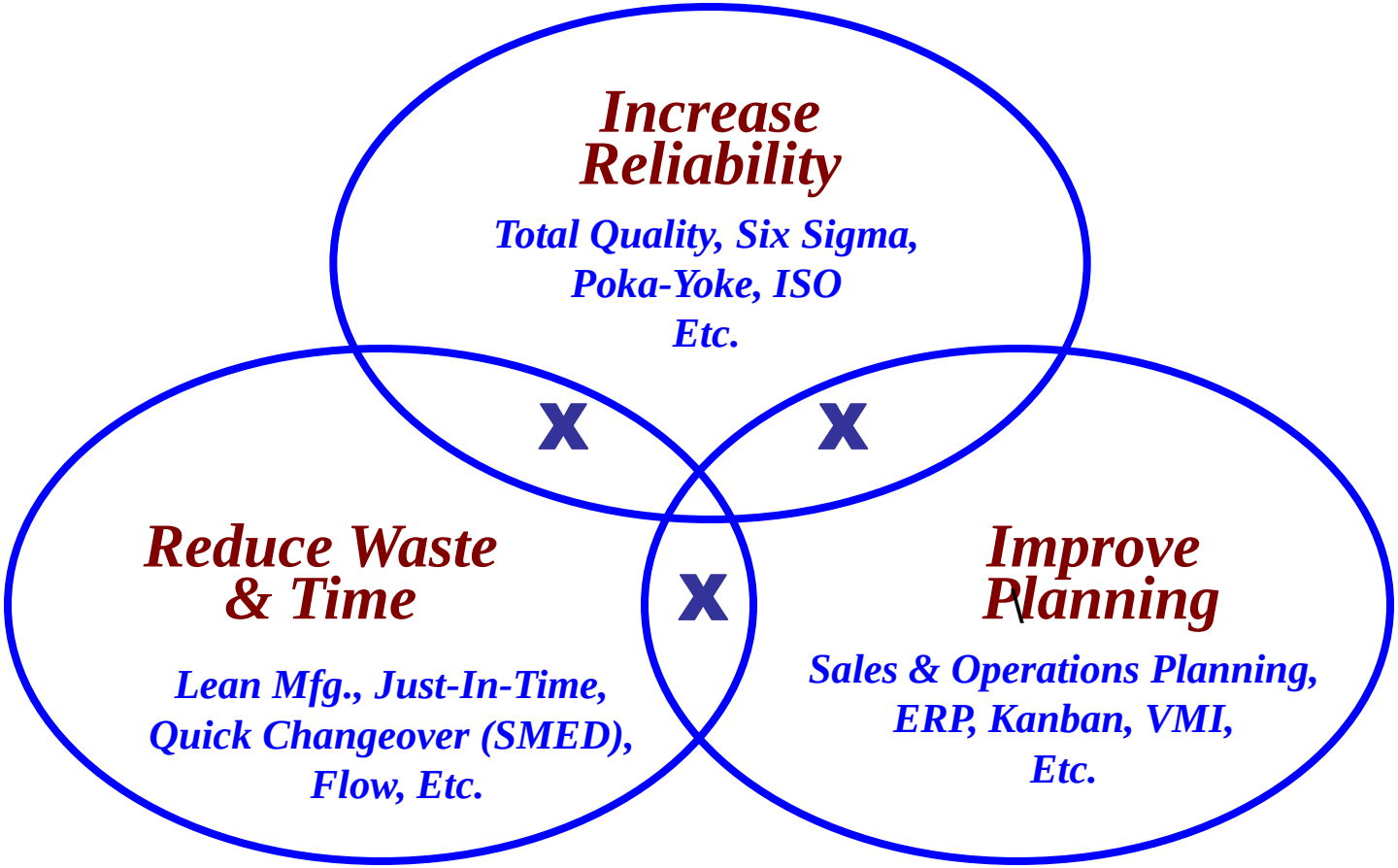
29 Years' Experience

- Lean Business Consultant
  - Sales & Operations Planning (S&OP)
  - Materials Management
  - Production Management
  - Business Systems
  - Warehouse Design and Management
  - Material Logistics
  - Inventory Control
  - Performance Measurement
- APICS Certified
- MBA

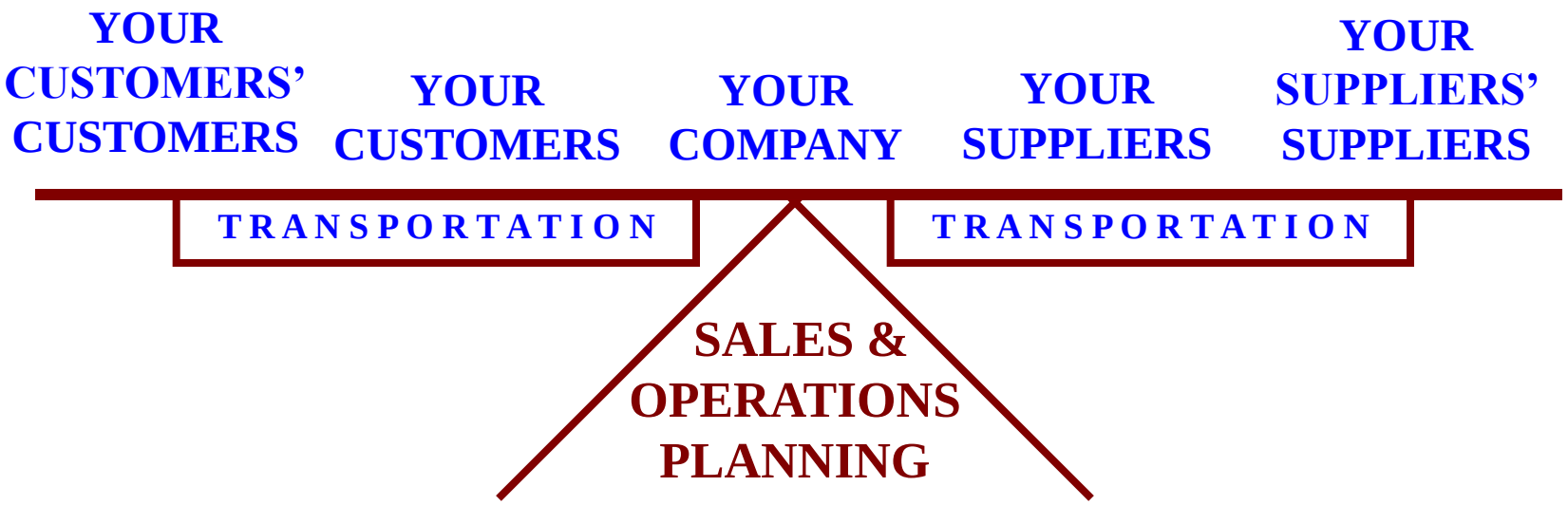
THE COMPETITION QUAD



Tools for Improving Effectiveness



The New Global Marketplace for Speed



Balancing the Supply Chain

SALES & OPERATIONS PLANNING

. . . is a set

of

Decision-Making Processes

to

Balance Demand & Supply

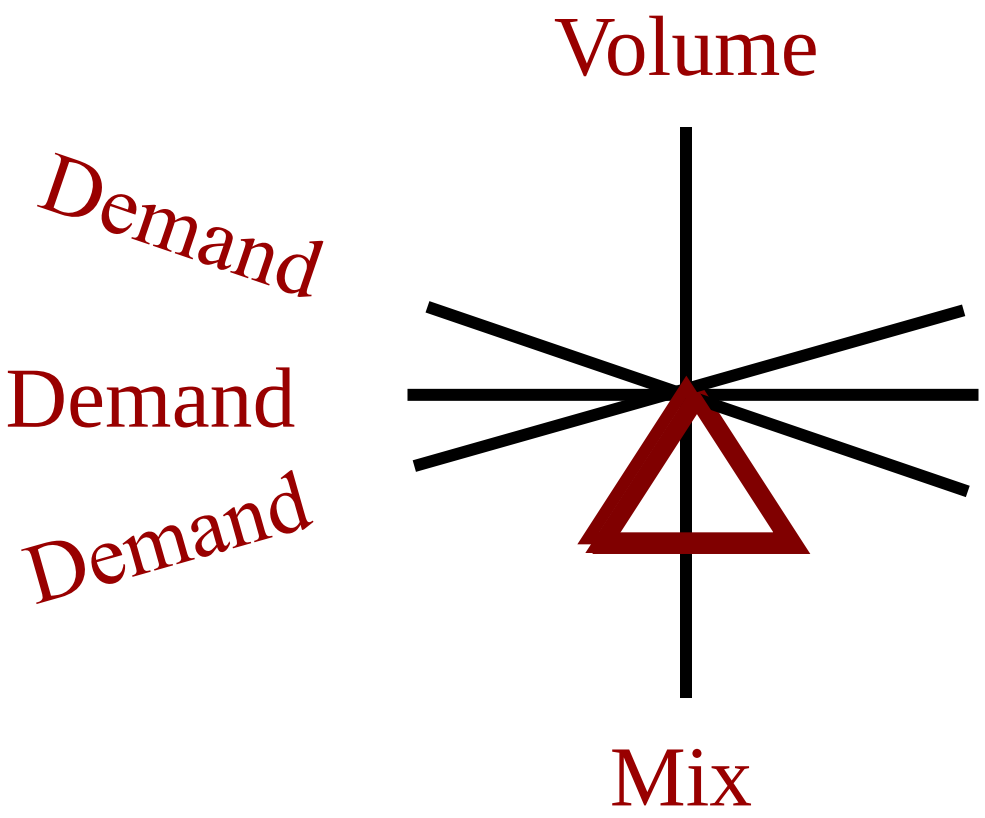
to

Align Volume and Mix

and to

Integrate Financial & Operating Plans

The Four Fundamentals



- How Much?
- Rates
- The Big Picture
- Families
- Strategy/Policy/Risk
- Monthly / 18 - 36 Mos
- Executive Resp.

- Which Ones?
- Timing/Sequence
- The Details
- Products / SKU's
- Tactics/Execution
- Weekly/Daily 1-3 Mos
- Middle Mgt. Resp.

Sales & Operations Planning

- S&OP is the Preferred Name….
  - Production planning
    - Only one portion of S&OP
  - Human Resources, Information Technologies, Finance
    - Important
    - Represents challenges
  - It effectively indicates the tradeoffs between the two functions of a firm

Purpose of S&OP

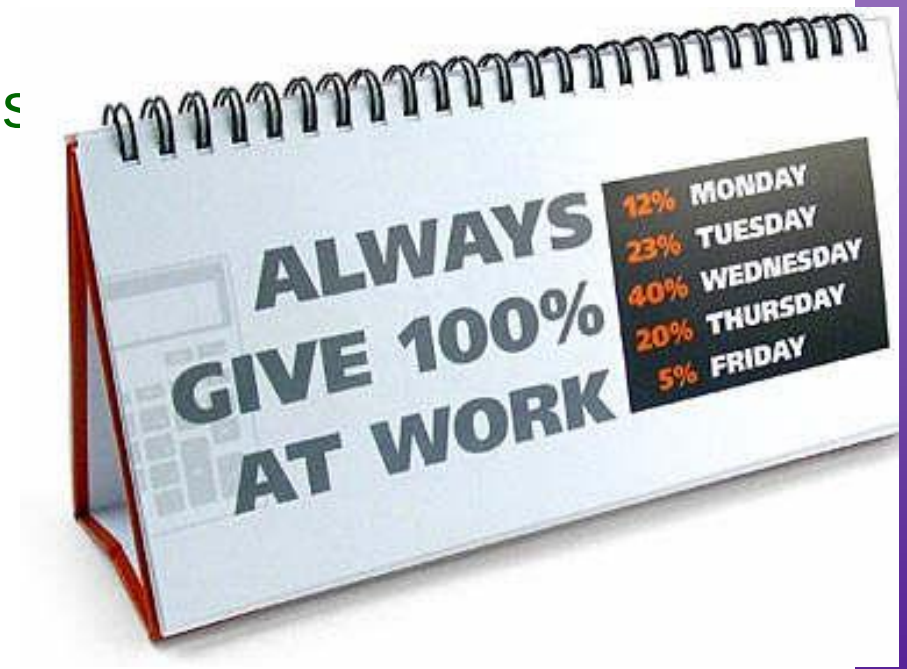
- Seldom used for the actual scheduling of production activity
- Its primary purpose is…
  - To plan for resources
  - Coordinate resources
    - Type
    - Quantity
    - Timing
- Time horizon for S&OP is determined by how long in the future the company needs to secure these resources

Purpose of S&OP (cont)

- Manufacturing tools can take longer than a year to design and build
- Takes time to
  - Train these staff members
  - Recruit suitable employees with the correct skill sets
- Finance needs what funds will be required over what time periods

Purpose of S&OP (cont)

- S&OP is the major source of planning for….
  - Inventory Levels
  - Cash Flow
  - Human Resource Needs
    - Number of people
    - Skill levels
    - Timing of need
    - Training program



Purpose of S&OP (cont)

- Capital needs
- Production outputs
- Capacity planning
- Sales and marketing activities
  - Sales promotions
  - Advertising
  - Pricing
  - New product introductions, expansion of markets

Objectives of S&OP

- Support and measure the business plan
- Support the customer
- Ensure that plans are realistic
- Manage change effectively
- Manage finished goods inventory or backlog to better service the customer
- Control costs
- Measure performance
- Build teamwork

Executive S&OP

- Leaders of the business unit (GM, CEO, COO) need to be hands on
- Stewardship & Leadership Responsibility
  - Breaking Ties
  - Set High Standards
  - Motivate

Monthly Time Commitment = 2 hours

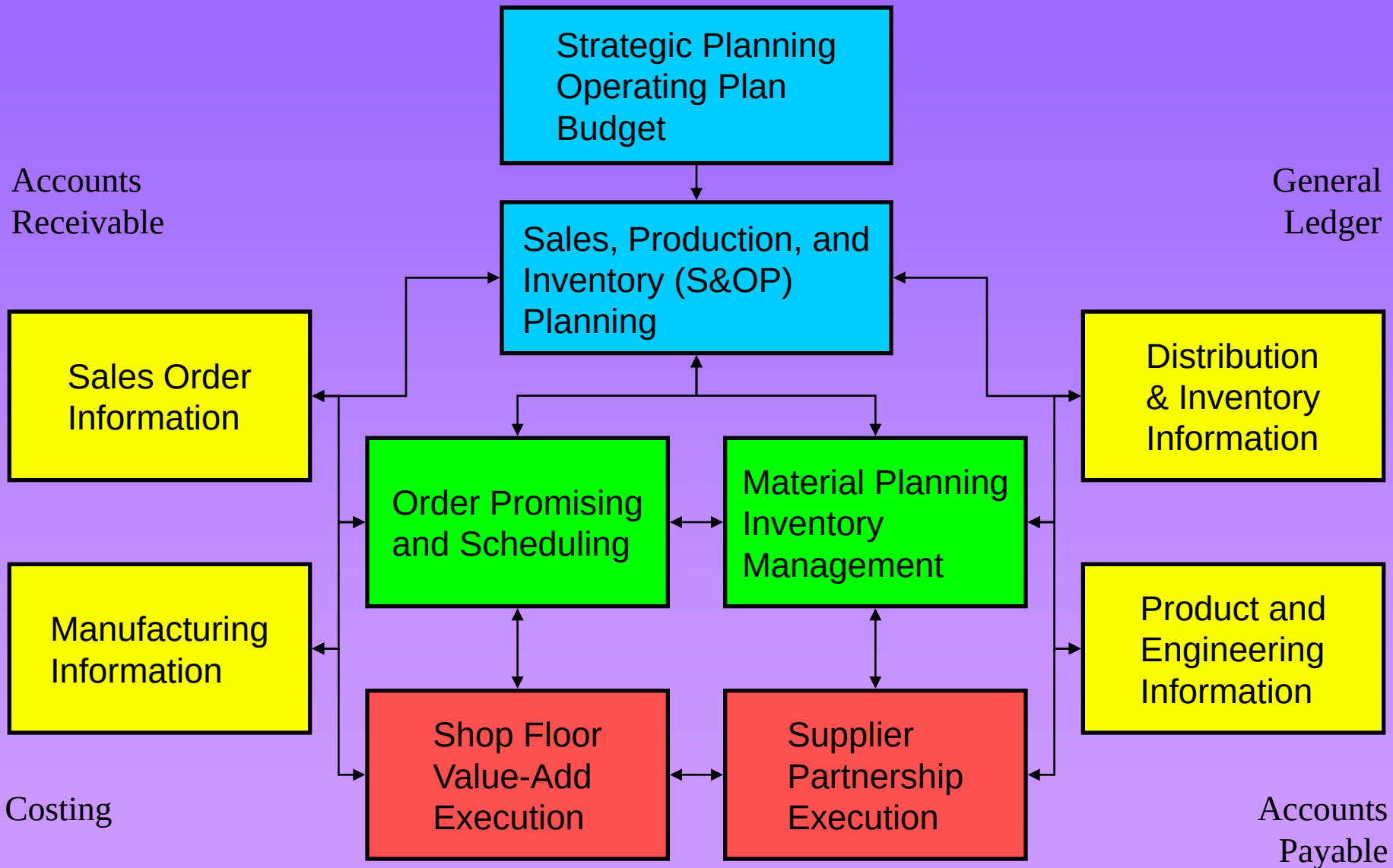
Enterprise Resource Planning

- ERP is an enterprise-wide information system which includes fully integrated and functionally complete manufacturing software.

Forecasting Demand Planning	Production Planning	Distribution Management	EDI and Electronic Commerce	Demand Chain Management
Warehouse Management	Transportation Planning	Supply Chain Optimization	Product Data Management	

LEAN CANNOT STAND ALONE!

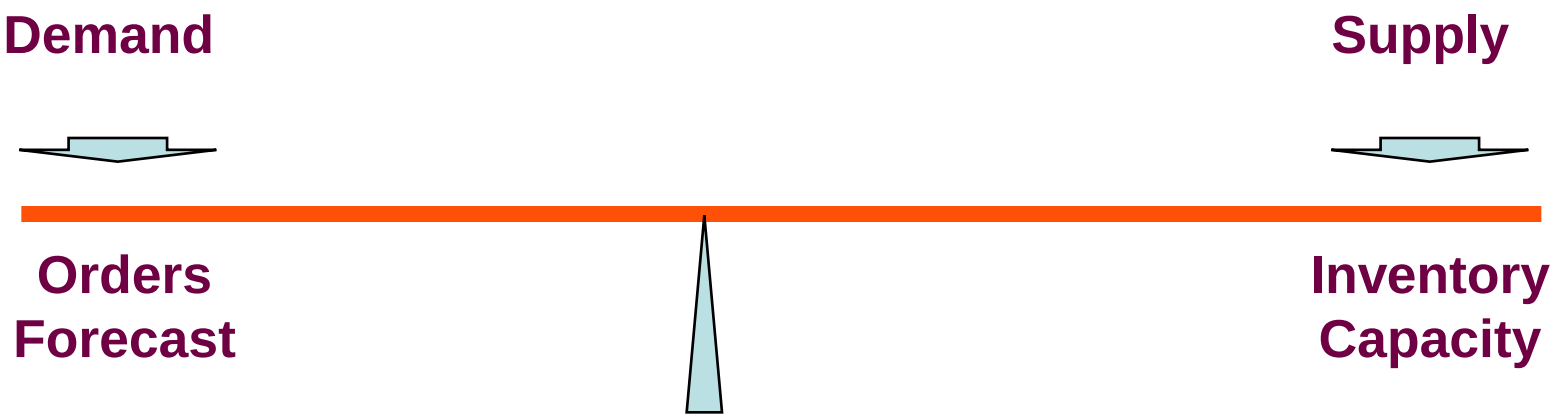
BUSINESS ENTERPRISE MODEL



S&OP Definition

Top Management's Handle on the Business

It is the activity for effectively balancing demand and supply on a regular and formal basis.



S&OP OVERVIEW

West Region

Central Region

East Region

Demand

Accounts

Customers

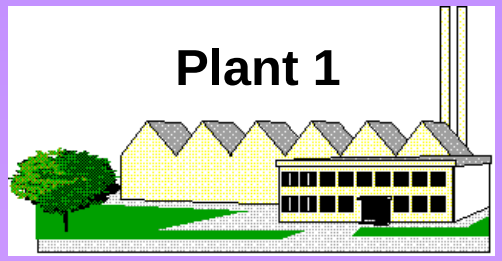
Sales

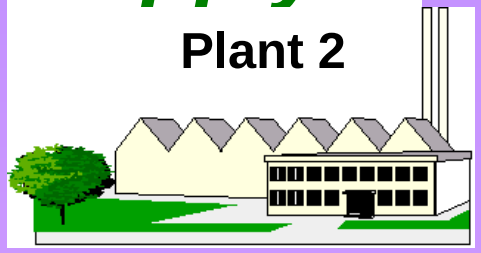
Mfg

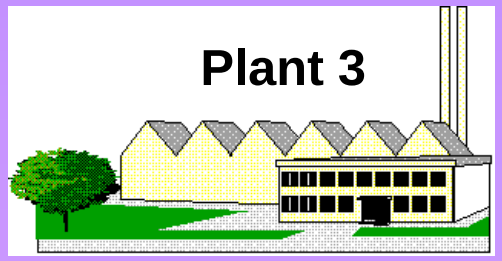
Line Rates

Products

Supply







Questions S&OP Addresses

- Does the rate of demand support the business plan?
- Will shipments provide planned revenue?
- Is the backlog at the desired level?
- Should inventory be increased or decreased?
- What is the rate of output at each plant by line?
- How many people are needed?
- What long lead time materials need attention now?
- Is additional capital equipment required?

Results of Effective S&OP

Companies Doing It

- One plan process
- Handshake between sales and manufacturing
- Demand and supply balance is planned
- Performance is predictable
- Cost is minimized
- On-time delivery is maximized

Companies That Should

- Multi plan process
- All business functions are silos
- Supply is reactive to demand
- Performance is disconnected opinions
- Costs are higher
- Late and early deliveries are common

S&OP Fundamentals

- What?
  - Aggregate level planning
  - Output is production rates by cell
- Who?
  - Top management
- When
  - Monthly
  - First of month
  - 12 Months forward
- How?
  - Demand Manager presents alternatives, top management reaches agreement

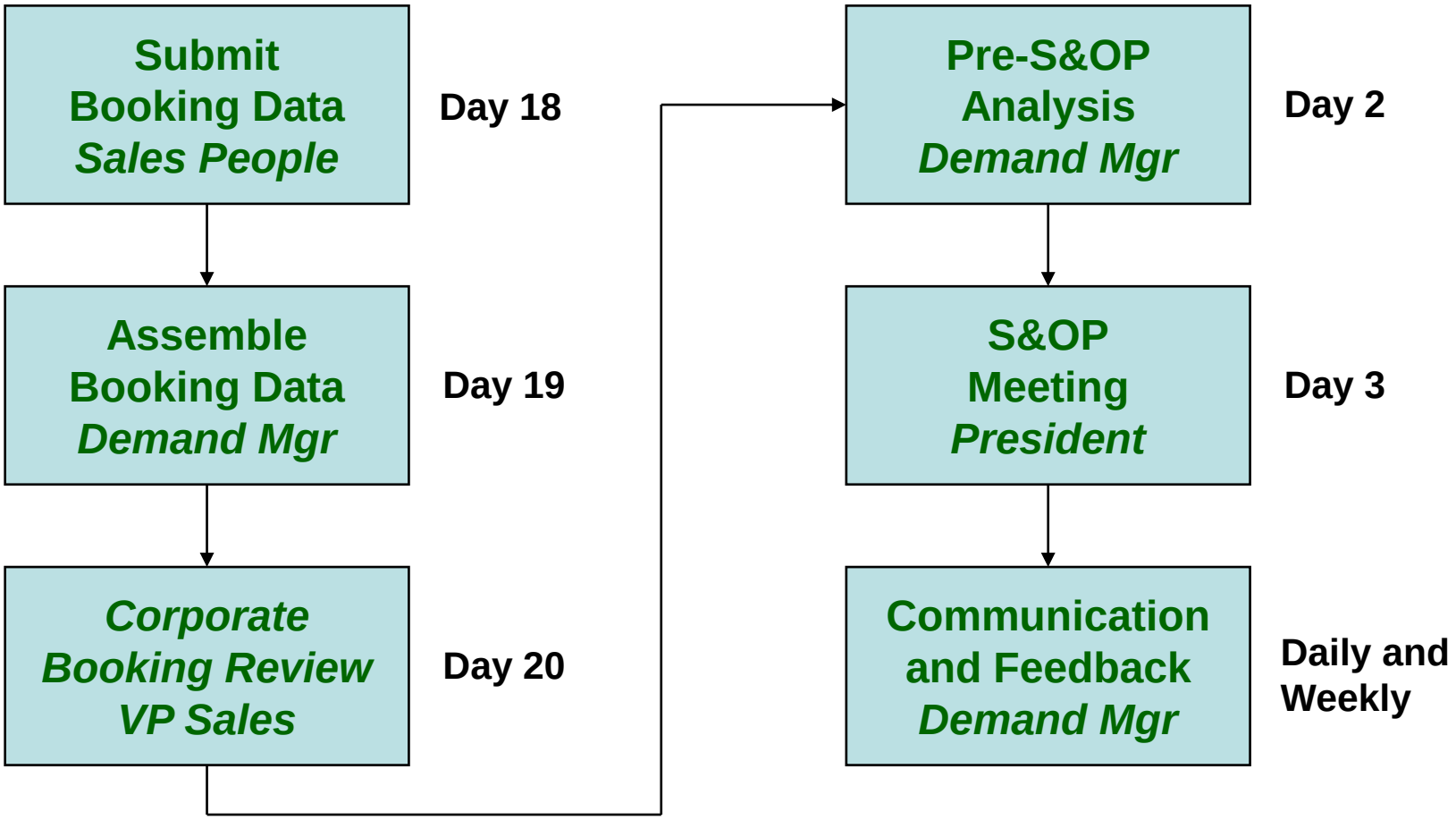
Six S&OP Definitions

Term	Definition	Accountable
Booking	Incoming orders (U/$)	Sales
Shipment	Orders shipped (U/$)	Manufacturing
Backlog	Bookings - Shipments	S&OP Result
Production	Goods completed (U/$)	Manufacturing
FGI	Production - Shipments	S&OP Result
Load	Resource needed (hours)	Manufacturing

S&OP Mechanics

		Jan	Feb	Mar	Apr	May	Jun
Bookings		40	30	20	30	50	40
Backlog	20	20	10	0	0	10	10
Shipments		40	40	30	30	40	40
Shipments		40	40	30	30	40	40
Finished Goods	50	50	50	60	70	70	70
Production		40	40	40	40	40	40
Ending Backlog + Bookings - Shipments = New Ending Backlog							
Finished Goods + Production - Shipments = New Finished Goods							

S&OP Process Steps



The Sales Organization – Step 1

What is their job?

How do they think?

Forecasting – Step 1

Typical

- SKU based
- Product thinking
- Done by manufacturing
- Reforecast annually
- Horizon is fixed
- Performance is unknown
- Feedback is weekly
- Post-processed actuals
- Forecasting software used

High Performance

- Group based
- Customer thinking
- Done by sales
- Updated monthly
- 12 month rolling horizon
- Performance accountability
- Feedback is weekly
- System generated actuals
- Forecasting process used

Submit Booking Data – Step 1

Sales Person A		Units	Dollars		**Sales Person B**		Units	Dollars
Customer One	Product A	500	$20,000		Customer Four	Product A	300	$12,000
	Product B	100	$5,000			Product C	500	$100,000
	Product C	200	$40,000			Product E	5,000	$10,000
Customer Two	Product B	200	$9,000		Customer Five	Product A	200	$8,000
	Product C	400	$100,000					
					Customer Six	Product A	100	$4,000
Customer Three	Product A	100	$4,000			Product D	600	$11,000
	Product D	800	$16,000			Product E	10,000	$25,000
Other Customers	All Products	500	$16,000		Other Customers	All Products	500	$20,000
		2,800	$210,000				17,200	$190,000

Data Aggregation – Step 2

Sales by Person				Sales by Customer				Sales by Product		
Sales Person A	2,800	$210,000		Customer One	800	$65,000		Product A	1,200	$48,000
Sales Person B	17,200	$190,000		Customer Two	600	$109,000		Product B	300	$14,000
				Customer Three	900	$20,000		Product C	1,100	$240,000
	20,000	$400,000		Customer Four	5,800	$122,000		Product D	1,400	$27,000
				Customer Five	200	$8,000		Product E	15,000	$35,000
				Customer Six	10,700	$40,000		Other	1,000	$36,000
				Other Customers	1,000	$36,000				
									20,000	$400,000
					20,000	$400,000				

Corporate Booking Review – Step 3

Who: VP Sales (Chair)
Regional Sales Managers
Business Unit Managers

When: 4th Wednesday, 9:00 am, Conference Room

What: Assess customer demand and state assumptions

Agenda: (How)

1. Review Bookings Performance MTD:
   Bookings by Person, Customer, Product
2. Review 6-12 month booking plan (sales forecast)
3. Review Action Items

Output: Updated booking plan
Related assumptions

Bookings Performance Review – Step 3

	Plan		Actual		Percentage	
Sales by Person	Units	Dollars	Units	Dollars	Units	Dollars
Sales Person A	2,800	$210,000	2,700	$195,400	96%	93%
Sales Person B	17,200	$190,000	18,000	$210,000	96%	90%
	20,000	$400,000	20,700	$405,400	96%	99%
Sales by Product						
Product A	1,200	$48,000	1,000	$45,000	83%	94%
Product B	300	$14,000	150	$7,000	50%	50%
Product C	1,100	$240,000	1,150	$245,000	96%	98%
Product D	1,400	$27,000	1,450	$28,000	97%	96%
Product E	15,000	$35,000	15,600	$36,000	96%	97%
Other	1,000	$36,000	1,350	$44,400	74%	81%
	20,000	$400,000	20,700	$405,400	83%	99%
Sales by Customer						
Customer One	800	$65,000	500	$45,000	63%	69%
Customer Two	600	$109,000	700	$127,400	86%	86%
Customer Three	900	$20,000	850	$20,000	94%	100%
Customer Four	5,800	$122,000	5,700	$115,000	98%	94%
Customer Five	200	$8,000	300	$12,000	67%	67%
Customer Six	10,700	$40,000	11,650	$50,000	92%	80%
Other Customers	1,000	$36,000	1,000	$36,000	100%	100%
	20,000	$400,000	20,700	$405,400	86%	99%

Booking Plan – Step 3

Sales by Product		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Business Plan
Product A	Units	1,000	900	1,050	1,200	1,200	1,200	1,300	1,300	1,500	1,500	1,500	1,600	15,250	15,000
$46	Dollars	$46,000	$43,000	$44,000	$48,000	$55,200	$55,200	$59,800	$59,800	$69,000	$69,000	$69,000	$73,600	$691,600	$690,000
Product B	Units	150	200	225	300	350	300	400	400	300	300	300	200	3,425	3,500
$50	Dollars	$6,500	$11,000	$12,000	$14,000	$17,500	$15,000	$20,000	$20,000	$15,000	$15,000	$15,000	$10,000	$171,000	$175,000
Product C	Units	918	1,054	850	1,100	1,000	1,000	900	800	1,200	1,500	1,500	1,200	13,022	13,500
$200	Dollars	$201,960	$231,880	$187,000	$240,000	$220,000	$220,000	$198,000	$176,000	$264,000	$330,000	$330,000	$264,000	$2,862,840	$2,950,000
Product D	Units	956	1,104	1,258	1,400	1,300	1,200	1,200	1,250	1,250	1,300	1,400	1,400	15,018	15,000
$20	Dollars	$19,345	$21,918	$24,329	$27,000	$26,000	$24,000	$24,000	$25,000	$25,000	$26,000	$28,000	$28,000	$298,592	$300,000
Product E	Units	11,300	14,233	15,983	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	176,516	200,000
$2	Dollars	$22,050	$27,916	$31,523	$35,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$356,489	$400,000
Other	Units	986	1209	861	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	12,056	14,000
$30	Dollars	$27,551	$39,427	$25,593	$36,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$368,571	$420,000
Total	Units	15,310	18,700	20,227	20,000	19,850	19,700	19,800	19,750	20,250	20,600	20,700	20,400	235,287	261,000
	Dollars	$323,406	$375,141	$324,445	$400,000	$378,700	$374,200	$361,800	$340,800	$433,000	$500,000	$502,000	$435,600	$4,749,092	$4,935,000

Assumptions

- Product B update is released in July
- Customer three renews their contract in September
- New salesperson A has an order administrator mid-year
- Demand in the Product A area continues strong
- Prime interest rate does not exceed 10% this year

The Production Organization – Step 4

What is their job?

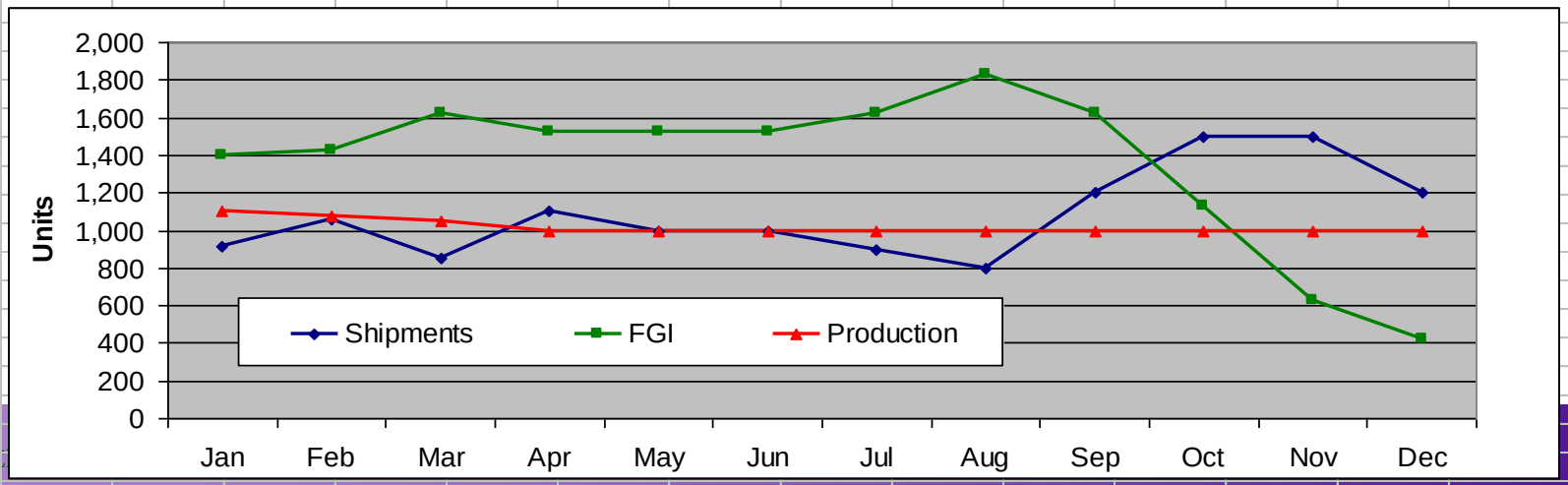
How do they think?

Pre-S&OP – Step 4

- Conducted by operating management
  - Plant Managers, Master Scheduler, Order Administration, Material Planners, Buyers
- Completed on/near first day of the month
- Evaluate sales impact on backlog, shipments, finished goods, inventory and production
- Develop alternatives

Pre-S&OP – Step 4

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bookings	Units	1050	900	825										
	Dollars	$231,000	$198,000	$181,500										
Backlog	Units	400	246	221	200	21								
	Dollars	$88,000	$54,120	$48,620	$44,000	$4,620								
Shipments	Units	918	1,054	850	1,100	1,000	1,000	900	800	1,200	1,500	1,500	1,200	13,022
	Dollars	$201,960	$231,880	$187,000	$240,000	$220,000	$220,000	$198,000	$176,000	$264,000	$330,000	$330,000	$264,000	$2,862,840
	Bus Plan	$200,000	$200,000	$200,000	$250,000	$250,000	$250,000	$200,000	$200,000	$300,000	$300,000	$300,000	$300,000	$2,950,000
FGI	Units	1400	1,426	1,626	1,526	1,526	1,526	1,626	1,826	1,626	1,126	626	426	
	CGS	$224,000	$228,160	$260,160	$244,160	$244,160	$244,160	$260,160	$292,160	$260,160	$180,160	$100,160	$68,160	
Production	Units	1,100	1,080	1,050	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	12,230
	Plant 1	600	580	600	600	600	600	600	600	600	600	600	600	
	Plant 2	400	400	450	400	400	400	400	400	400	400	400	400	
	Plant 3	100	100	0	0	0	0	0	0	0	0	0	0	



Plant Production Plan – Step 4

			Actual			Plan									
Plant 1 - Production Plan Detail			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Budget
			19	20	25	20	19	20	19	20	24	20	18	22		
Line One	Product A	Units	200	200	200	300	300	300	300	300	300	300	300	300	3,300	3,000
	0.35	Hours	70	70	70	105	105	105	105	105	105	105	105	105	1,155	1,000
	Product B	Units	200	300	300	400	500	600	700	700	700	800	800	800	6,800	700
	0.20	Hours	40	60	60	80	100	120	140	140	140	160	160	160	1,360	1,400
	Daily Rate - Hours		6	7	5	9	11	11	13	12	10	13	15	12		
Line Two	Product C	Units	600	580	600	600	600	600	600	600	600	600	600	600	7,180	7,000
	2.20	Hours	1,320	1,276	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	15,796	15,000
	Product D	Units	500	500	500	500	500	500	500	500	500	500	500	500	6,000	6,000
	0.70	Hours	350	350	350	350	350	350	350	350	350	350	350	350	4,200	4,200
	Daily Rate - Hours		88	81	67	84	88	84	88	84	70	84	93	76		
Line Three	Product E	Units	3,000	4,000	4,500	3,000	4,000	4,000	5,000	6,000	6,000	6,000	7,000	7,000	59,500	60,000
	0.30	Hours	900	1,200	1,350	900	1,200	1,200	1,500	1,800	1,800	1,800	2,100	2,100	17,850	18,000
	Daily Rate - Hours		47	60	54	45	63	60	79	90	75	90	117	95		
Total Plant 1		Hours	2,680	2,956	3,150	2,755	3,075	3,095	3,415	3,715	3,715	3,735	4,035	4,035	40,361	40,000
		People	20	21	18	20	23	22	26	27	22	27	32	26		25
	Daily Rate - Hours		141	148	126	138	162	155	180	186	155	187	224	183		

S&OP Meeting – Step 5

Who:

President (Chair)	Demand Manager
VP Sales	VP Manufacturing
VP Finance	VP Materials
VP Engineering	VP Human Resource

When: 1st Wednesday, 9:00 am, Conference Room

What: Finalize the production plan for six months

Agenda: (How)

1. Review Performance:
   Bookings, Shipments, Production, and Inventory

2. Review six month outlook:
   Bookings, Backlog, Shipments, Inventory, Production, Load

3. Review Action Items

Output: Production rates by line/cell

Performance Review – Step 5

Joe Cell

Shipments	Plan		Actual		Percentage	
	Units	Dollars	Units	Dollars	Units	Dollars
Product A	1,000	$12,000	900	$11,000	90%	92%
Product B	200	$10,000	250	$12,000	80%	83%
Product C	1,100	$240,000	850	$187,000	77%	78%
Product D	1,500	$30,000	1,450	$28,000	97%	93%
Product E	15,000	$38,000	15,600	$36,000	96%	95%
Other	1,000	$36,000	1,350	$44,400	74%	81%
	19,800	$366,000	20,400	$318,400	86%	87%

Ralph High

Inventory	Plan		Actual		Percentage	
	Units	Dollars	Units	Dollars	Units	Dollars
Product A	2,000	$14,400	1,505	$10,836	75%	75%
Product B	200	$6,000	322	$9,660	62%	62%
Product C	1,600	$256,000	1,646	$260,160	97%	98%
Product D	4,000	$48,000	3,887	$46,644	97%	97%
Product E	25,000	$50,000	15,000	$30,000	60%	60%
Other	1,000	$21,600	991	$21,406	99%	99%
	33,800	$396,000	23,351	$378,706	82%	96%

S&OP Performance Review – Step 6

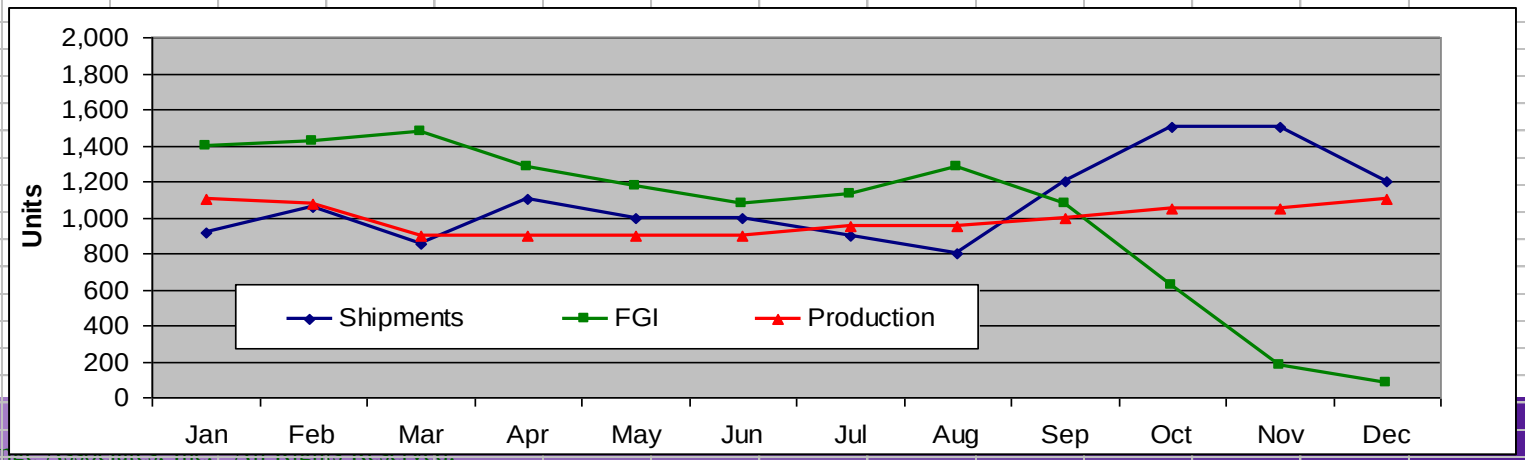
Joe Cell

Production (Plant 1)		Plan	Actual	%%%
Line One	Product A	250	200	80%
	Product B	250	300	83%
	Total	500	500	100%
Line Two	Product C	800	600	75%
	Product D	500	500	100%
	Total	1300	1100	85%
Line Three	Product E	4000	4500	89%

S&OP Plan – Step 5

Product C - SPI - Any Company, Inc.

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bookings	Units	1050	900	825										
	Dollars	$231,000	$198,000	$181,500										
Backlog	Units	400	246	221	200	21								
	Dollars	$88,000	$54,120	$48,620	$44,000	$4,620								
Shipments	Units	918	1,054	850	1,100	1,000	1,000	900	800	1,200	1,500	1,500	1,200	13,022
	Dollars	$201,960	$231,880	$187,000	$240,000	$220,000	$220,000	$198,000	$176,000	$264,000	$330,000	$330,000	$264,000	$2,862,840
	Bus Plan	$200,000	$200,000	$200,000	$250,000	$250,000	$250,000	$200,000	$200,000	$300,000	$300,000	$300,000	$300,000	$2,950,000
FGI	Units	1400	1,426	1,476	1,276	1,176	1,076	1,126	1,276	1,076	626	176	76	
	CGS	$224,000	$228,160	$236,160	$204,160	$188,160	$172,160	$180,160	$204,160	$172,160	$100,160	$28,160	$12,160	
Production	Units	1,100	1,080	900	900	900	900	950	950	1,000	1,050	1,050	1,100	11,880
	Plant 1	600	580	600	600	600	600	600	600	600	600	600	600	
	Plant 2	400	400	300	300	300	300	350	350	400	450	450	500	
	Plant 3	100	100	0	0	0	0	0	0	0	0	0	0	



Communication – Step 6

- Demand Manager's Job
- Complete packet containing
  - Performance review
  - Outlook by product family
  - Plant run rates by line
  - Action items
- Timing is day after the meeting

S&OP Results

- Demand and supply are in balance
- Inventory and backlog objectives are planned
- Sales and manufacturing have a handshake
- There is a one-plan process
- Customers' demand is rationalized
- Assumptions are shared
- Top Management has a handle on the business

A Note On Product Coding

SKU's in the item master must carry the proper codes to facilitate reporting:

Marketing Code - Sales Forecasting
Materials Code - Planning BOM
Production Code - Factory Line

Designing Your S&OP Process

- What?
- Who?
- When?
- How?

ORDER PROMISING AND SCHEDULING

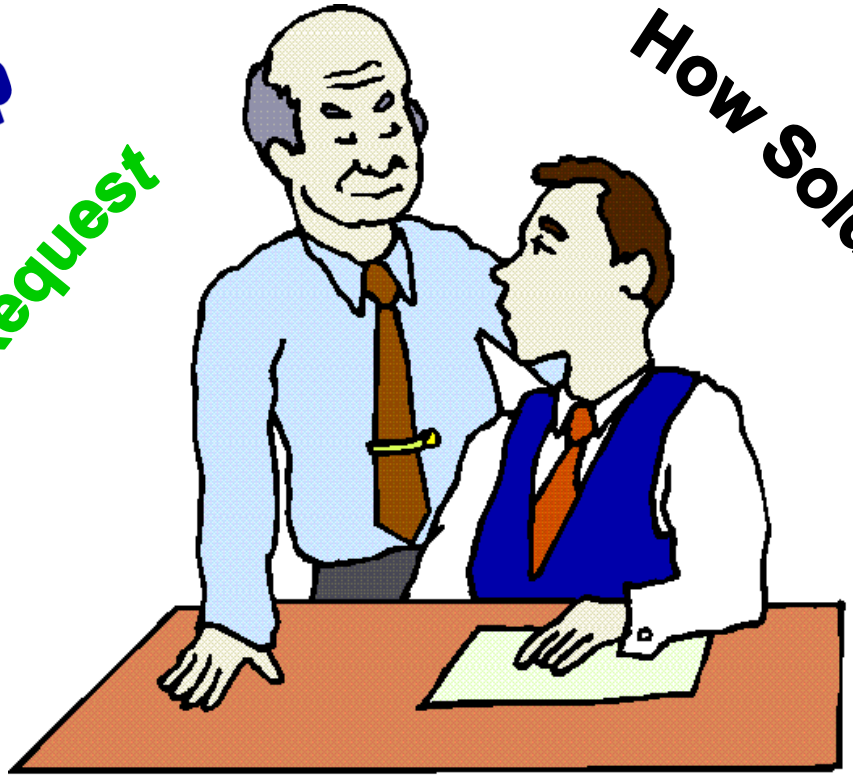
Order Promising

Standard Lead Time

Who's Calling??

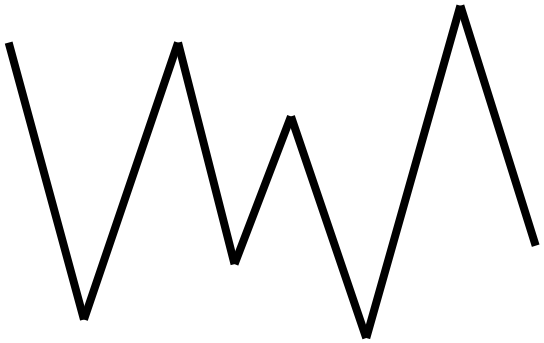
How big is the order?

Customer Request



How Sold Out Are We?

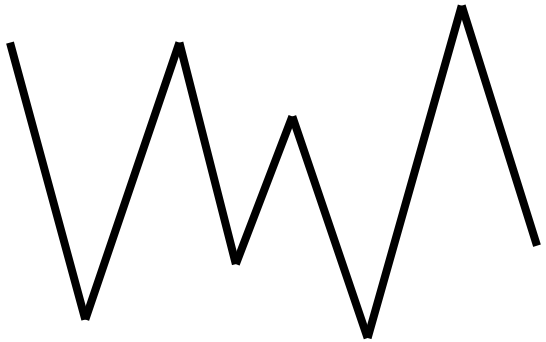
The Effect of Standard Lead Time



Variation in demand

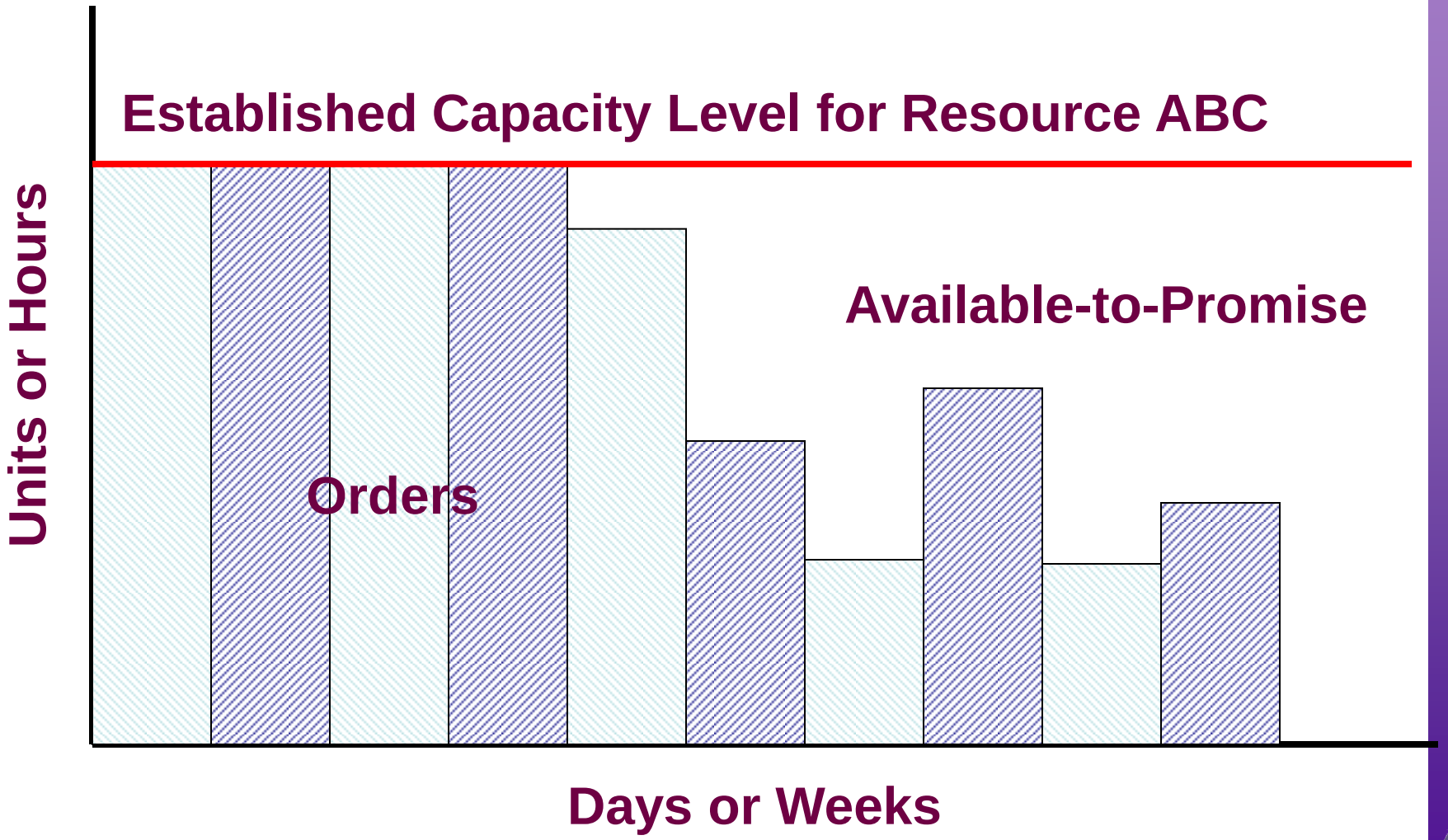
Offset by quoted lead time

Variation in production



Standard Lead Time

Available-to-Promise



Promising Delivery

- Enter the order at the SKU level, and assess ATP at the rate (line or family level
- Inventory ATP is not the issue, **capacity** ATP is the issue
- Promised dates move in or out depending on how sold-out the line is
- The line must consider customer orders and FGI replenishment orders

Traditional Inventory Based ATP

SKU		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
1234	Fcst	50	50	50	50	50	40
	Orders	50	40	30	20	25	10
	ATP	0	10	20	30	25	30
9876	Fcst	10	5	10	20	30	30
	Orders	10	5	10	20	20	20
	ATP	0	0	0	0	10	10
5678	Fcst	30	25	30	20	10	20
	Orders	0	5	0	0	0	0
	ATP	30	20	30	20	10	10
8765	Fcst	10	10	10	10	10	10
	Orders	10	10	10	10	10	10
	ATP	0	0	0	0	0	0

Capacity (Rate-Based) ATP

SKU		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Total	Fcst	100	90	100	100	100	100
	Orders	70	60	50	50	55	40
	ATP	30	30	50	50	45	60

Promise 10 units of 9876:

- Traditional inventory based _____?

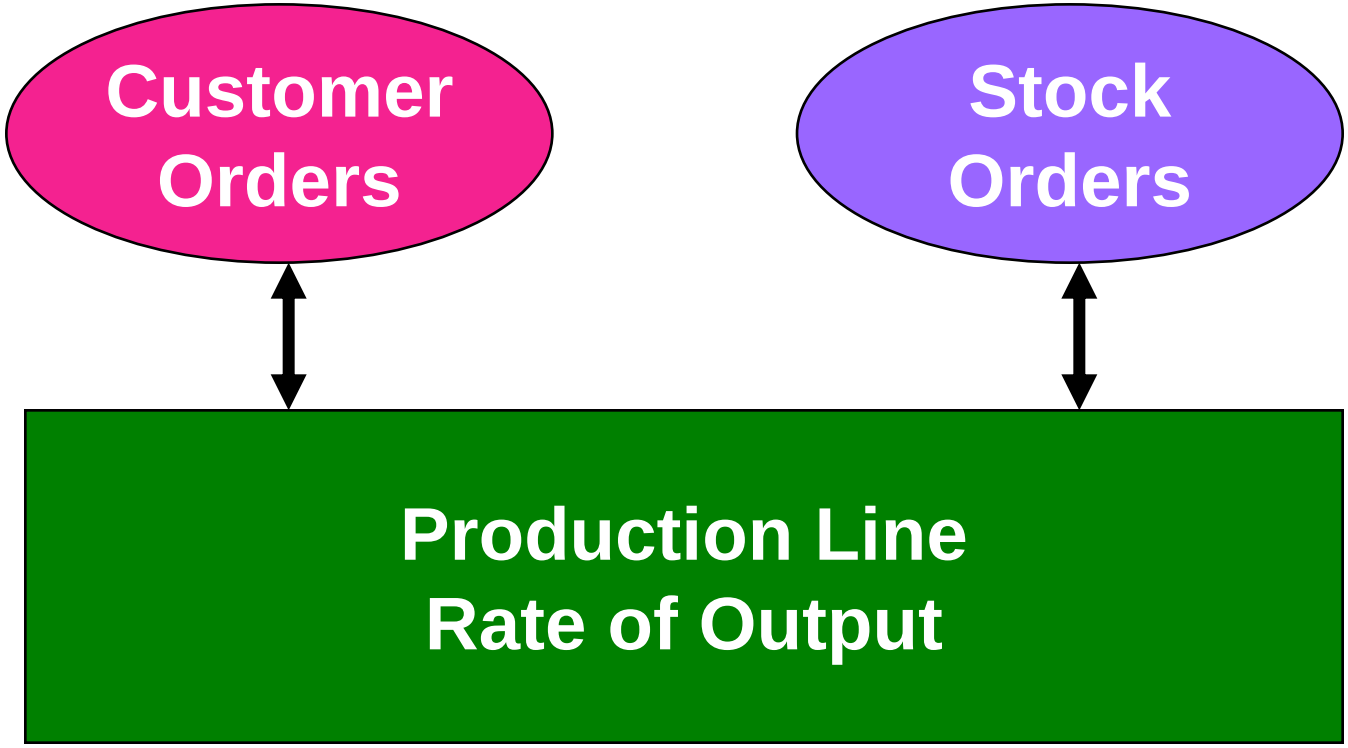
- Rate based _____?

Now promise 70 units of 1234:

- Traditional inventory based _____?

- Rate based _____?

Types of Orders



Most ATP considers only customer orders

Key Promising Principles

- Most missed shipments are missed the moment the promise is made
- You can only produce what capacity allows
- When an order moves in , one must move out (if capacity is maximized).
- You can deal with it formally, or just let things happen
- Changing promises require changing dates

Order Promising Decision Model

MTS	FGI	Promise next day
ATO	Assemblies	Promise Assy Slot
MTO	Raw Material	Promise Mfg Slot
ETO	Suppliers	Promise Engr Slot

ORDER DATES

What happens when a sales order goes past due?

Open Order Status

P/N	Desc	Customer	WO	Qnty	Due Date
123	Part 1	Acme Co.	W345	20	07/19/97
321	Part Z	Bonus Inc.	W213	10	10/21/97
412	Part V	Calder Corp.	W617	15	09/30/97
721	Part B	Dexter	W332	35	08/15/97
312	Part Y	Mullins, Inc.	W444	10	11/15/97
123	Part 1	Pump Co.	W212	20	06/06/97
843	Part G	Rollins Corp.	W231	20	10/30/97
321	Part Z	Summer Mill	W773	25	09/15/97
983	Part J	Tustin Corp.	W333	5	09/20/97
662	Part U	TCA Inc.	W909	15	09/30/97

Open Order Status – Cell/Line A

P/N	Desc	Customer	WO	Qnty	Original Due Date	Current Due Date
123	Part 1	Pump Co.	W212	20	06/06/97	09/30/97
123	Part 1	Acme Co.	W345	20	07/19/97	10/01/97
321	Part Z	Bonus Inc.	W213	10	10/21/97	10/04/97
				50		
412	Part V	Calder Corp.	W617	15	09/30/97	10/08/97
721	Part B	Dexter	W332	35	08/15/97	10/10/97
				50		
843	Part G	Rollins Corp.	W231	20	10/30/97	10/16/97
321	Part Z	Summer Mill	W773	25	09/15/97	10/18/97
983	Part J	Tustin Corp.	W333	5	09/20/97	10/18/97
				50		
662	Part U	TCA Inc.	W909	15	09/30/97	10/22/97
312	Part Y	Mullins, Inc.	W444	10	11/15/97	10/23/97

Sales Order Management

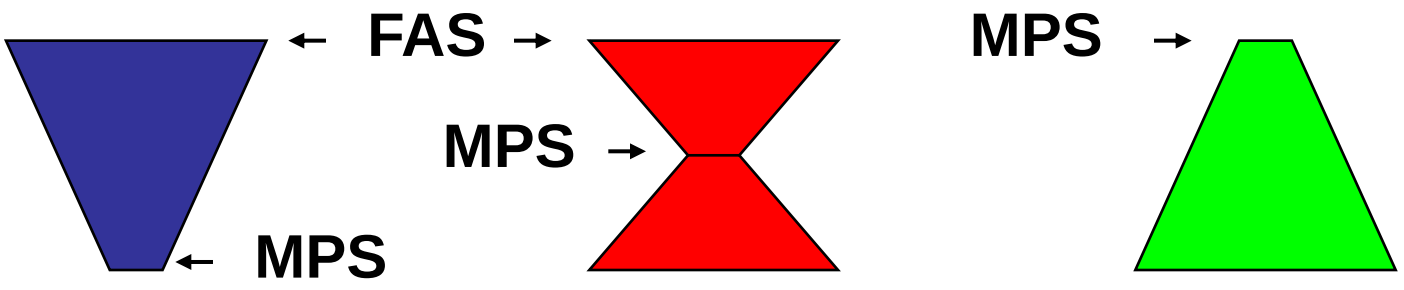
- Who is accountable for the sales order current dates?
- When should these dates be updated?
- How is the update accomplished?

Master Production Schedule

- Statement of items that will be produced or planned
- Derives directly from the production plan created in the S&OP process, and must support the production plan
- Is the mechanism to effectively deal with change in demand and supply
- Is updated weekly/daily
- Is the responsibility of the master scheduler

Master Production Schedule (cont)

- The Master Schedule horizon must be as long as the total lead time of all purchased materials and manufactured parts/assemblies
- The schedule level changes as the strategy changes



Traditional MPS

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
1234	MPS	50	50	0	100	275	0
9876	MPS	60	100	0	175	0	275
5678	MPS	100	0	200	0	0	0
8765	MPS	65	125	75	0	0	0

These are all buildable items

Simplified MPS

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Line 2	PP	0	275	245	275	275	275
1234	MPS	50					
9876	MPS	60					
5678	MPS	100		30			
8765	MPS	65					

MPS items are buildable, PP is a planning item.

Mfg Lead Time

MPS Report Format

First sort by line or cell.

Second sort by due date.

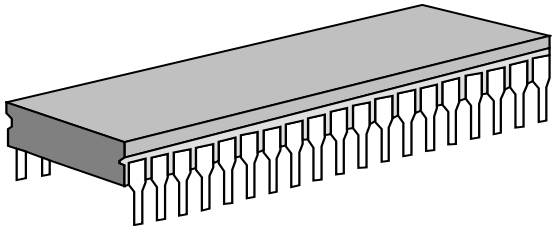
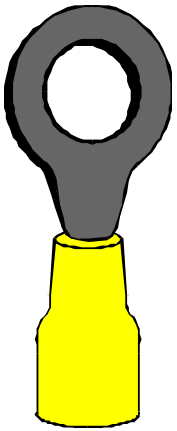
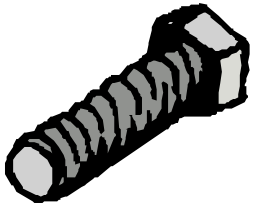
Weekly/daily quantities match the S&OP rate.

Item	Type	Quantity	Due Date
1234	CO	50	4-13-xx
9876	CO	60	4-15-xx
5678	CO	100	4-16-xx
8765	FG	65	4-16-xx
	Total	275	
Line 2	PP	275	4-24-xx
Line 2	PP	245	5-1-xx
5678	CO	30	5-1-xx
	Total	275	
Line 2	PP	275	5-8-xx
Line 2	PP	275	5-15-xx
Line 2	PP	275	5-22-xx

ABC Analysis is a tool to separate the critical few from the trivial many

It is also known as the 80-20 rule, meaning 80% of the benefit is contained in 20% of the analysis

Examples

“A”	“B”	“C”
		
Expensive	**Intermediate**	**Low Dollar**

Example Calculation

Part Number	Unit Cost	Monthly Usage	Dollar Volume
1	$0.05	1,000	$50
2	$1.20	5,000	$6,000
3	$0.01	100	$1
4	$0.02	20,000	$400
5	$1.50	100	$150
6	$0.67	500	$335
7	$0.70	200	$140
8	$1.30	2,000	$2,600
9	$0.02	100	$2
10	$0.03	200	$6

Sort from high dollar to low dollar.

Establish a cut-off.

Example Calculation (cont)

Part Number	Unit Cost	Monthly Usage	Dollar Volume	Item Percent	Dollar Percent	Cumltv Dollar
2	$1.10	5,500	$6,050	10%	66%	66%
8	$0.55	2,000	$1,100	10%	12%	78%
4	$0.05	20,000	$1,000	10%	11%	88%
6	$0.67	500	$335	10%	4%	92%
5	$1.50	300	$450	10%	5%	97%
7	$0.70	200	$140	10%	2%	98%
1	$0.05	1,000	$50	10%	1%	99%
10	$0.10	400	$40	10%	0%	99%
9	$0.07	600	$42	10%	0%	100%
3	$0.01	800	$8	10%	0%	100%
			$9,215			

Which items are A? B? C?

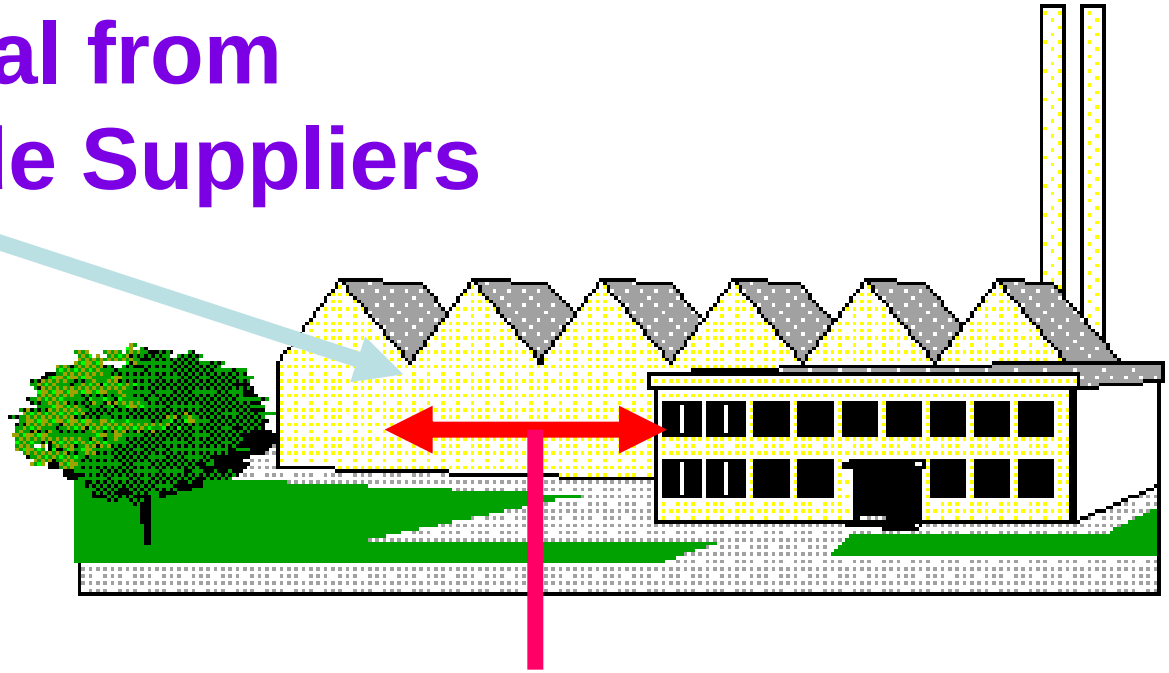
ABC Applications

- Control A items closely
- Allow more freedom with “C” items
- “B” items are in the middle

MATERIAL PLANNING STRATEGIES

Material Planning

Material from Outside Suppliers

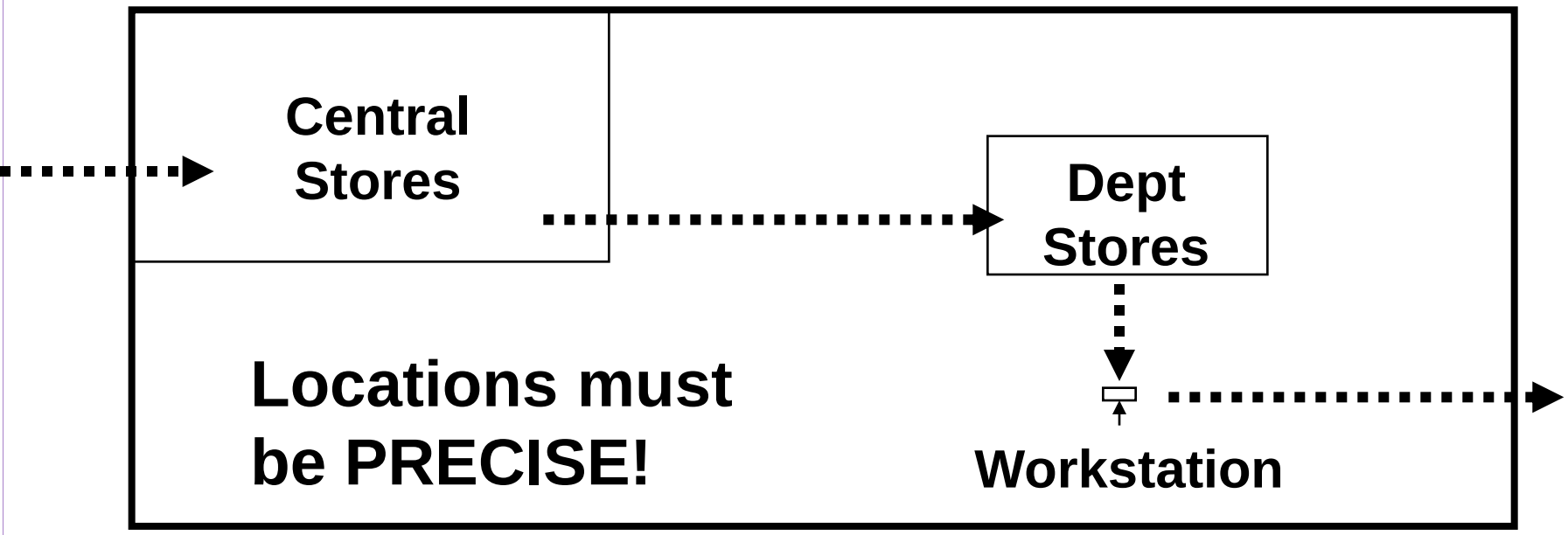


Internally Produced Parts and Assemblies

TWO FUNDAMENTAL QUESTIONS

1. Where will the material be stored?
2. How will it be replenished?

Storage



Where do transactions occur?
Where are on-hand balances maintained?
How many locations for the same part?
What is the material flow?

Replenishment Options

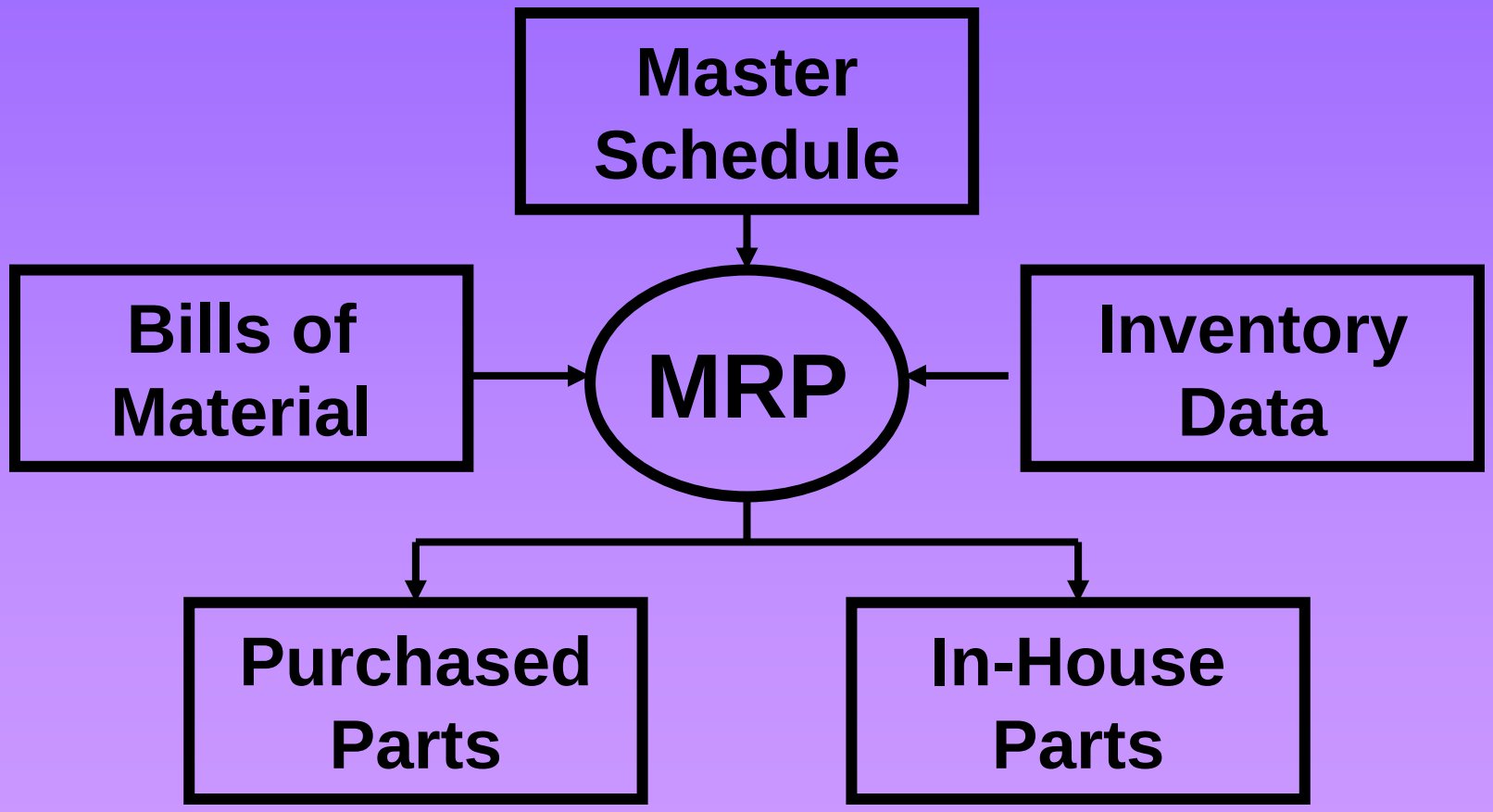
Dependent

- Material Requirements Planning (MRP

Independent

- Order Point
- Two Bin
- Surveillance

MATERIAL REQUIREMENTS PLANNING

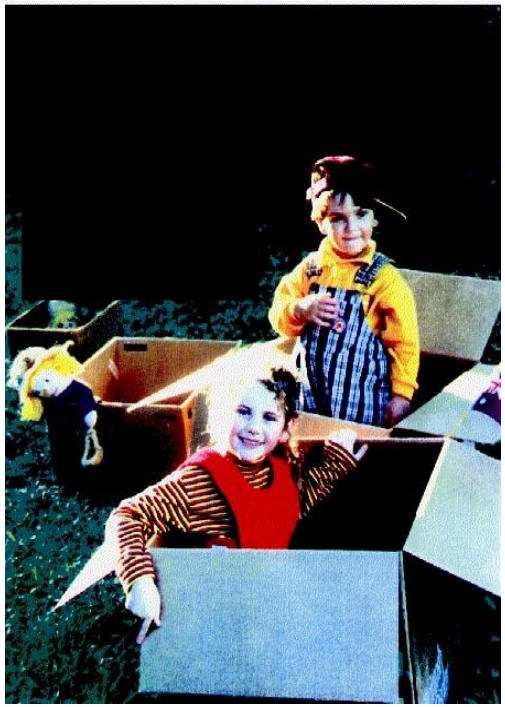


Order - Reschedule - Cancel

PERFORMANCE ACCOUNTABILITY

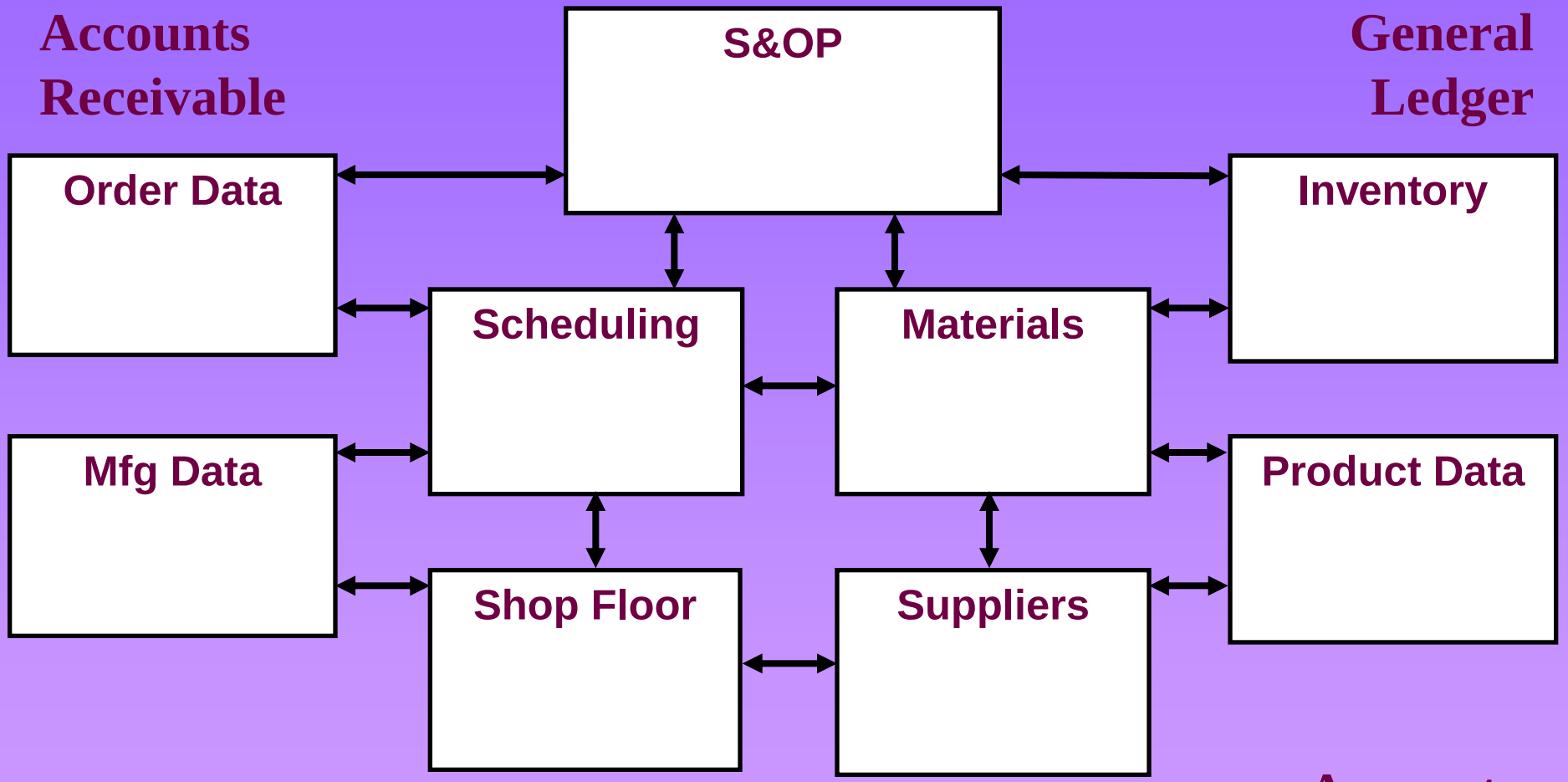
The Box Rules – Brent Allen

- One kid per box
- Boxes have to be given to you, it's not nice to steal
- If you are in someone else's box, get out so they can get in
- If you are not going to play in your box, give it to someone else
- If you see an empty box, find a friend for it
- If we all work together, there will be plenty of boxes for everyone



Kids or Business!

WHOSE NAMES IS IN THE BOX?



The Performance Measures

- Business Plan
- Sales Plan
- Production Plan
- Inventory Plan
- On-Time Shipments

The Performance Measures (cont)

- Scheduling
- Materials
- Capacity
- Shop Floor
- Purchasing

The Performance Measures (cont)

- Inventory Accuracy
- Routings
- BOM's
- Orders
- Accounting

PERFORMANCE SUMMARY PAGE

Remanufactured Service Parts Class A Definition Revised: December 16,1997

Area	Accountability	Measurement Definition		Frequency	Meeting	Status	Goal
Performance to Plan							
Business/Sales Plan	Steve Wilson	Percentage of customer requests satisfied.	001	Monthly	Slice	G D	95%
		Revenue vs. plan.	002	Monthly	Slice	G D	95%
Production Plan	Mike Everett	Internal rate of output vs. forecast	003	Daily	Production	G D	95%
Master Schedule	Kim Arnold	Detail schedule detail quantity equals production forecast	004	Weekly	Slice	G D	95%
Material Planning	Scott Manning	Orders held for material vs. total orders inducted into work	005	Weekly	Slice	G D	95%
	Kim Arnold	Repair order release inside lead-time vs. total orders released	006	Weekly	Slice	G D	95%
	Dennis Zimmerman	Detail parts order releases inside lead-time vs. total orders released	007	Weekly	Slice	G D	95%
Inventory Dollars	Brian Pasquinelli	Core dollars vs. forecast	008	Monthly	Slice	G D	95%
	Brian Pasquinelli	WIP dollars vs. forecast	009	Monthly	Slice	G D	95%
Purchasing	Dennis Zimmerman	Detail part items on-time vs. total items received	011	Weekly	Slice	G D	95%
	Kim Arnold	Repair part items on-time vs. total items received	012	Weekly	Slice	G D	95%
Shop Floor	Kim Arnold	Percentage of RSPT dates that are valid (no passt due) Inhouse	013	Weekly	Slice	G D	95%
Supplier	Kim Arnold	Percentage of RSPT Dates that are valid (no past due) suppler	014	Weekly	Slice	G D	95%
Data Accuracy							
BOM's	Dennis Zimmerman	1 - Number of mistakes vs. orders produced	015	Weekly	Slice	G D	98%
Inventory	Scott Hamby	Number of line items correct vs. number of line items counted	016	Daily	Slice	G D	98%
Open Orders	Scott Manning	Number of mistakes vs. number of open orders (Customer)	017	Weekly	Slice	G D	98%
Rate of Improvement (Health)							
Delivery	Mike Everett	RSP & RR items shipped on-time (original promise) vs. total items shipp	018	Daily	Production	G D	95%
Quality	Brian Pasquinelli	Number Of Field Complaints	019	Monthly	Slice	G D	95%
Productivity	Brian Pasquinelli	Parts produced per person (total team headcount)	020	Monthly	Slice	G D	20
Cycle Time	Brian Pasquinelli	Average time in process per part.	021	Monthly	Slice	G D	15 Days

PERFORMANCE HISTORY PAGE

Remanufactured Service Parts Class A Performance History 1998

Area	Accountability	Measurement Definition		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Performance to Plan															
Business/Sales Plan	Steve Wilson	Customer Requests	001												
	Steve Wilson	Revenue	002												
Production Plan	Mike Everett	Output	003												
Master Schedule	Kim Arnold	Schedule	004												
Material Planning	Scott Manning	Material Shortages	005												
	Kim Arnold	Repair Release Reliability	006												
	Dennis Zimmerman	Detail Release Reliability	007												
Inventory Dollars	Brian Pasquinelli	Core dollars	008												
	Brian Pasquinelli	WIP dollars	009												
	**********	**********	010												
Purchasing	Dennis Zimmerman	Detail part items on-time	011												
	Kim Arnold	Repair part items on-time	012												
Shop Floor	Kim Arnold	Percentage of RSPT Dates Valid	013												
Supplier	Kathie Driver	Percentage of RSPT Dates Valid	014												
Data Accuracy															
BOM's	Dennis Zimmerman	BOM Accuracy	015												
Inventory	Scott Manning	Inventory Record Accuracy	016												
Open Orders	Scott Manning	Open Order Accuracy	017												
Rate of Improvement (Health)															
Delivery	Mike Everett	RSP & RR items shipped on-tim	018												
Quality	Brian Pasquinelli	Number Of Field Complaints	019												
Productivity	Brian Pasquinelli	Parts produced per person-hour	020												
Cycle Time	Brian Pasquinelli	Average time in process per part.	021												
Totals															