ABC's of Inventory Optimization

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About Us

- Corporate focus on Medical Supply Chain
- Founded in 1979
- Headquarters in Clifton, NJ
- 25+ years of Distribution Industry Experience
- 15+ years of Medical Supply Chain Experience
- Experienced Management and Support Staff
- Our Software - Developed, Supported, and Maintained by TSH
- Software Customization Services with complete warranty protection
- Full Implementation Lifecycle
- Single Source of Support 7 X 24

TSH – Supply Chain Management for the Real World

- Modules Available
  - Purchasing
  - Sales force automation (CRM)
  - E-Commerce Remote Net
  - Financial Management AR/AP/GL
  - WMS – Wireless or Paper based
  - Delivery Master/Package Tracking
  - Records Retention

The Inventory Management Conflict

Minimize Inventory Carrying Costs
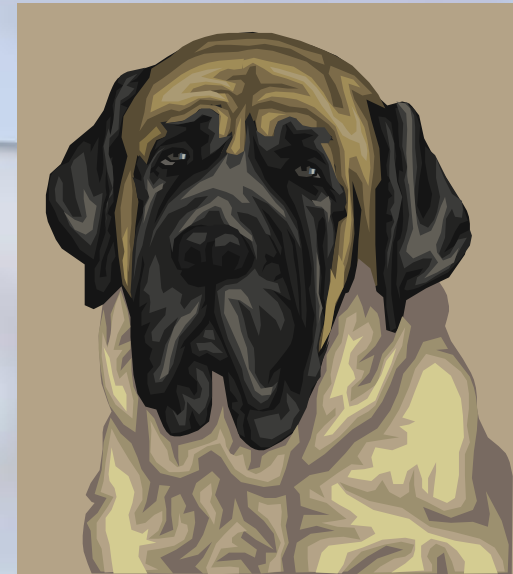## *While*
Maximizing Service Levels

"Nothing is more frustrating then seeing a dust covered pallet in a prime picking zone while customers complain about backorders and stockouts"

– Unnamed business owner

Teaching an old dog new tricks MCIC

- M – Multi
- C – Criteria
- I – Inventory
- C – Classification

- The well-known ABC classification is simple-to-understand and easy-to-use. However, ABC analysis is based on only single measurement such as annual dollar usage. It has been recognized that other criteria are also important.

- Convert all criteria measures of an inventory item into a scalar score (1,2,3). The classification based on the calculated scores using ABC principle is then applied.

Classical ABC Criteria

- Unit volume
- Sales volume
- Gross profit
- Cost volume
- #of hits
  - orders
  - replenishment
  - transfers

Alternate Ranking Criteria

- Part criticality
- Lead time
- Commonality
- Obsolescence
- Substitutionality
- Order size requirements
- Carrying cost
- Pick Velocity

Part Criticality

- Criticality is used to determine the importance of each end-item in order to accurately derive the impact on Stock outs

Lead Time

- What is your definition of the term "Lead Time"?

- Lead time begins with the first receipt of a customer order and ends with receipt of the product or service. Everything in between is the lead time.

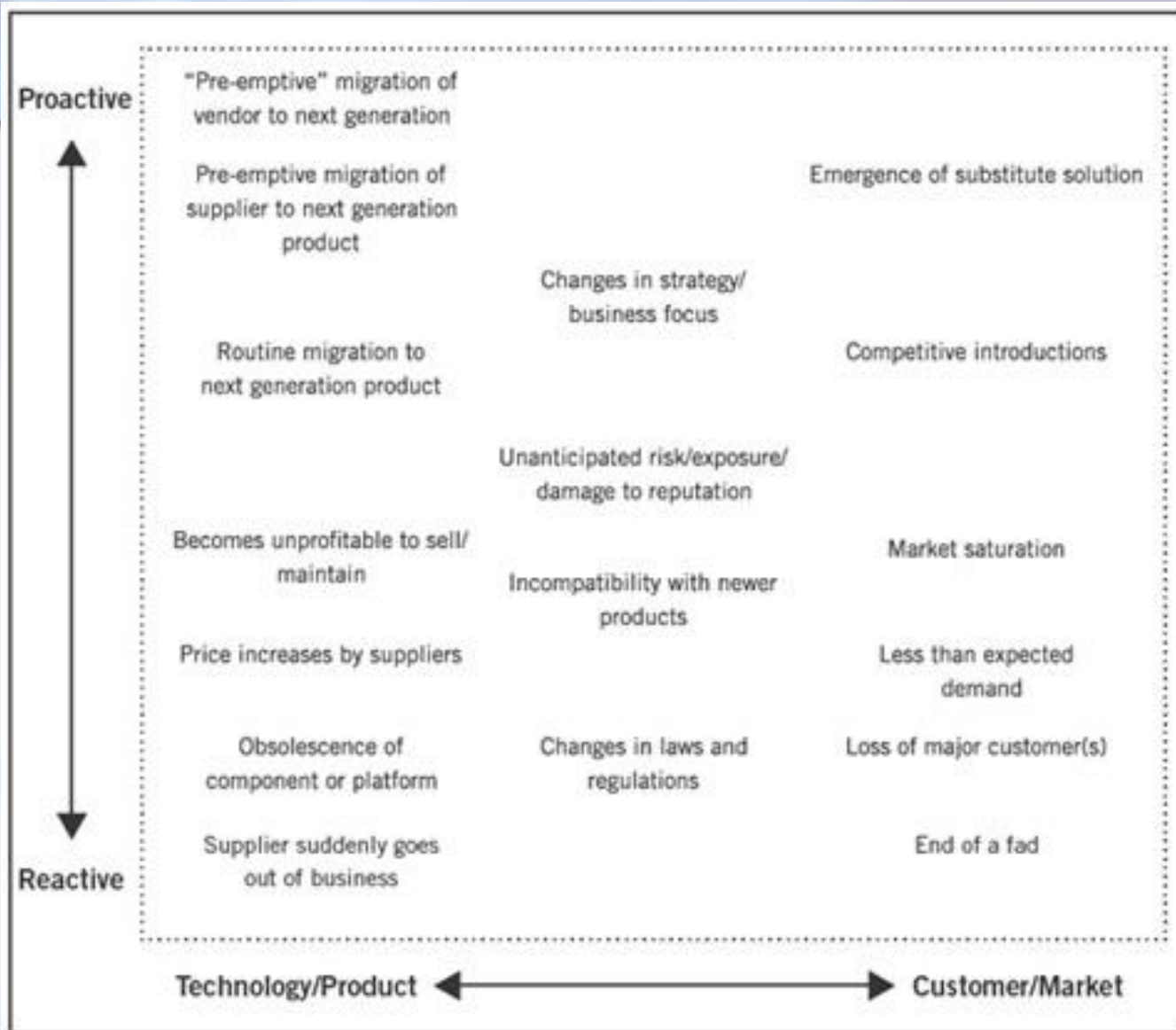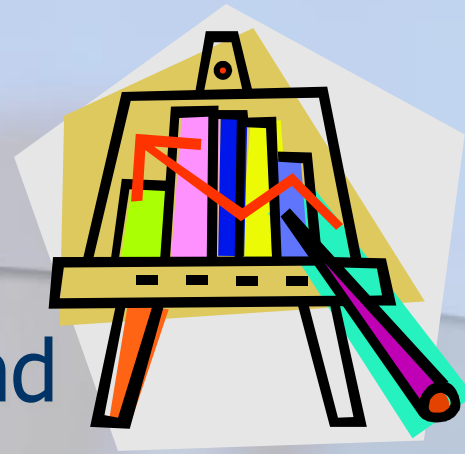- The scope of the lead time can vary for the purposes of analysis.

Commonality

- Replacing several products by a single common product can reduce required safety stock levels due to the benefits of risk pooling.

Product obsolescence

A matrix diagram with vertical axis labeled "Proactive" (top) to "Reactive" (bottom) and horizontal axis labeled "Technology/Product" (left) to "Customer/Market" (right).

"Pre-emptive" migration of vendor to next generation

Pre-emptive migration of supplier to next generation product

Emergence of substitute solution

Changes in strategy/ business focus

Competitive introductions

Routine migration to next generation product

Unanticipated risk/exposure/ damage to reputation

Becomes unprofitable to sell/ maintain

Market saturation

Incompatibility with newer products

Price increases by suppliers

Less than expected demand

Obsolescence of component or platform

Changes in laws and regulations

Loss of major customer(s)

Supplier suddenly goes out of business

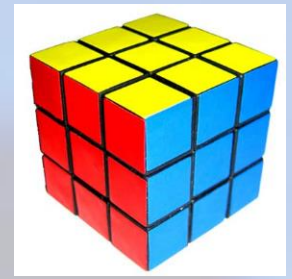End of a fad

Substitutionality

- Microeconomic Preference and Indifference Curves
- Marginal Rate of Substitution
- Degree of Substitutionality
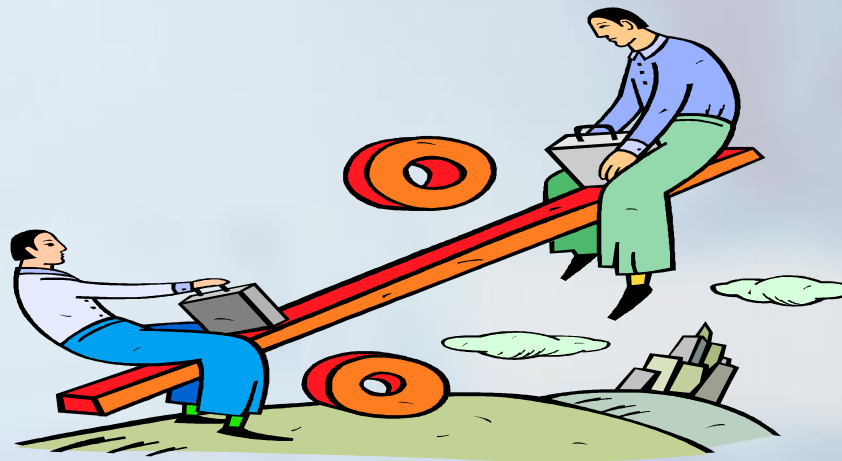
Order size Requirements

- Minimum purchase orders
- Dollars/Quantity
- Cubes/ Trailer Loads
- Overseas – Container Loads

Carrying Costs (K)

Warehouse Space	$130,000
Taxes	$65,000
Insurance	$40,000
Obsolesce and Shrinkage	$60,000
Material Handling	$64,800
Cost of Money	$200,000
Total Annual Costs	$559,800

Total Annual Costs	**$559,800**	**Percentage Carrying Cost**
Avg Inventory Value	**$2,000,000**	**= 28% (K)**

Gordon Graham

Distribution Inventory Management for the 1990's

Whse Operations Criteria

- ## Pick Velocity

- Assign zones within areas that categorize prime picking.
  - Prime zones are typically the first rack in the shipping zone, away from dead storage areas such as a mezzanine location
  - Few companies have formal location velocity codes, or velocity-ranked zones and areas. A location velocity code prioritizes the accessibility and travel time to a pick location in your distribution center.

- ## The pick velocity is the number of visits or trips a picker makes to a product's location within a given period of time.

What's in storage
Feb 1, 2006
Stephen G. Martin

Create Ranking Codes

- Create Criteria Columns
- Assign a value per Criterion Code (A=4,B=3…)
- Update in database or update sheet
- Total values and create MCIC Velocity

Determine ABC Levels

ABC Product Ranking Update

1. Warehouse — All

2. Enter Ranking Criteria

3. A Item Cutoff

4. B Item Cutoff

5. C Item Cutoff

Inquiry List

Settings   Help

ACCEPTABLE VALUES :

U	Unit Volume
S	Sales Volume
G	Gross Profit
C	Cost Volume
N	# of Orders

Add   OK   Cancel

| HELP | OK/END | INSERT | LDELETE | PREV PG | NEXT PG | INQUIRY | CANCEL | Off | | | Popup |

File   Edit   View   Insert   Format   Tools   Data   Window   Help

Arial   10   B   I   U

G7   fx   10

	A	B	C	D	E	F	G
1	A_PROD_NO	PROD_DESC	VELOCITY-Sales Dollars	VELOCITY-Criticality	WLOC1	VELOCITY -Pick	Total Velocity
2	GLVE650130	GLOVE NS LTX SM PWDRFREE	A	A	002110956	A	12
3	GLVE650132	GLOVE NS LTX MD PWDRFREE	A	A	002110957	A	12
4	GLVE650134	GLOVE NS LTX LG PWDRFREE	A	D	002110958	A	9
5	02-5300	GLOVE NS ULTRACARE SM 100	A	A	002110994	A	12
6	513029-42	OLYMPIC UNISEX SWEATER	A	A	003104330	B	10
7	513029-44	OLYMPIC UNISEX SWEATER	A	A	003104338	B	10
8	513029-46	OLYMPIC UNISEX SWEATER	A	D	003104344	B	12
9	513029-48	OLYMPIC UNISEX SWEATER	A	A	003104351	B	12
10	513029-50	OLYMPIC UNISEX SWEATER	A	A	003104361	B	9
11	513029-52	OLYMPIC UNISEX SWEATER	A	A	003104370	B	12
12	513029-54	OLYMPIC UNISEX SWEATER	A	D	003104377	B	10
13	513029-56	OLYMPIC UNISEX SWEATER	A	A	003104386	B	10
14	MMD3	SYRINGES 30CC PLASTIC	A	A	SRC115483	A	12
15	TREXWD86	WHEELCHAIR,MIDNIGHT BLUE	A	A	002111169	A	12
16	33239	OXYGEN CANNULA ADULT 7'	A	A	003110504	A	9
17	117155-065	ADVANTAGE MENS BOOT	A	A	002102195	C	12
18	117155-070	ADVANTAGE MENS BOOT	A	A	002102200	C	10
19	117155-075	ADVANTAGE MENS BOOT	A	D	002102206	C	10
20	117155-100	ADVANTAGE MENS BOOT	A	A	002102262	C	12
21	117155-105	ADVANTAGE MENS BOOT	A	A	002102270	C	12
22	T3	3" STEEL TUBING	A	A	002126281	C	9
23	T12	12" STEEL TUBING	A	A	002126282	C	12
24	T6	6" STEEL TUBING	A	A	002126283	C	10
25	BW-601	TYPE RHL SINGLE CONDUCTOR	A	A	002126292	A	10
26	117155-120	ADVANTAGE MENS BOOT	A	A	002102285	C	12
27	BW-603	TYPE RHL DOUBLE CONDUCTOR	A	A	002126293	A	12
28	117155-125	ADVANTAGE MENS BOOT	A	A	002102287	C	9
29	101	RED PLASTIC DESK	A	A	001100000	A	12
30	102	BLUE PLASTIC DESK	A	B	001100001	D	10
31	103	BROWN PLASTIC DESK	A	D	001100002	D	10
32	104	ULTRA RED PLASTIC DESK	A		001100003	D	

Sheet1   Sheet2   Sheet3

Service Levels/Safety Stock
The Poisson Distribution

Velocity Code	Service Level Objective	Safety Stock Required
A	93%	148%
B	85%	104%
C	75%	68%
D	50%	0%
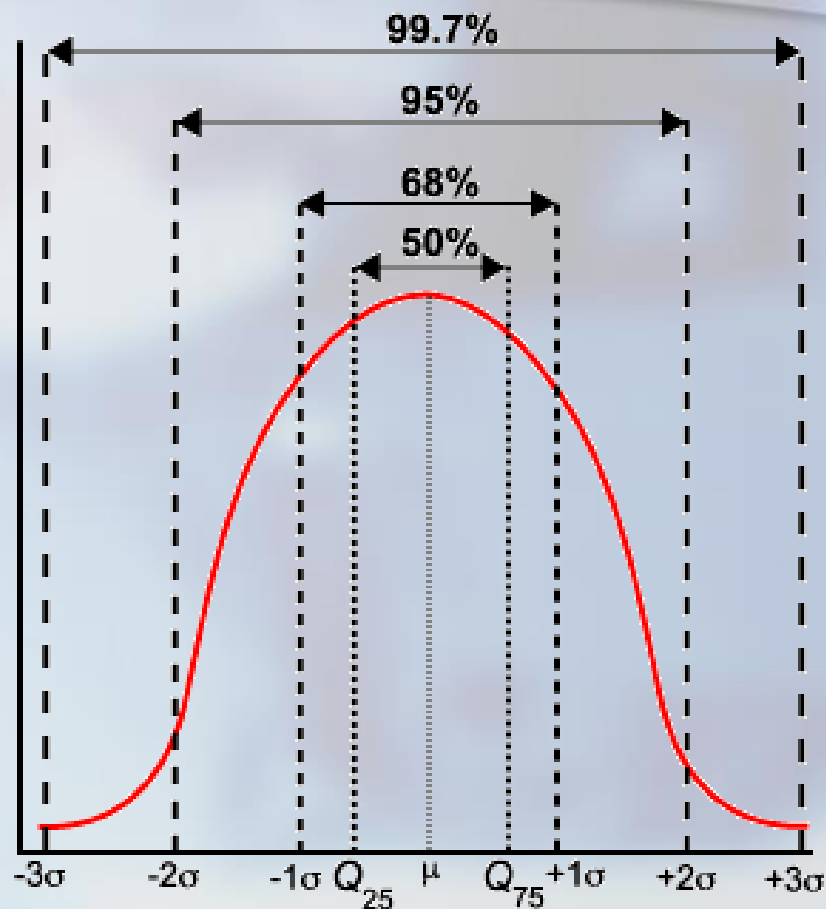
Service Level Goals

Standard Deviations

50	60	70	75	80	85	90	91	92	93	94	95	96	97	98	99
0	0.25	0.52	0.68	0.84	1.04	1.28	1.34	1.41	1.48	1.56	1.65	1.76	1.88	2.06	2.33

Setup Your Service Levels

Inventory Management Parameters - Basic Settings   PARAMETER   IM.PARAM

			Demand Scaling Factor - Non Seasonal	
1.ROP Months Non Seasonal		5		
2.ROP Months Seasonal		3	16.#	
3.A Item Service Level		148.00	1.	5
4.B Item Service Level		104.00	2.	4
5.C Item Service Level		68.00	3.	3
6.D Item Service Level		0.00	4.	2
7.Single Service Level		0.00	5.	1
8.PO Cost Source		2	6.	1
9.Default Purchasing Lead Time		2.0	7.	1
10.Default Admin Lead Time		0.5	8.	1
11.Alpha Constant for Lead Time		0.3	9.	1
12.Purchasin Lead Time Minimum		25.00	10.	1
13.Purchasing Lead Time Maximum		200.00	11.	1
14.Default ROP/Min Months		0.0	12.	1
15.Default ROQ/Max Months		0.0		

ENTER LINE # TO CHANGE,DELETE TO DELETE,0 TO ACCEPT :   XXXXXX   PAGE 1 OF 2

| HELP | OK/END | INSERT | LDELETE | PREV PG | NEXT PG | INQUIRY | CANCEL | | | | | Popup |

Sample Reorder Calculation

- Example: Product GLVE650132
- Sales Demand = 20 Units
- Velocity Level = AAA (12) Highest possible
  - Safety factor is 50%
  - Vendor/Item minimum months is 2.0
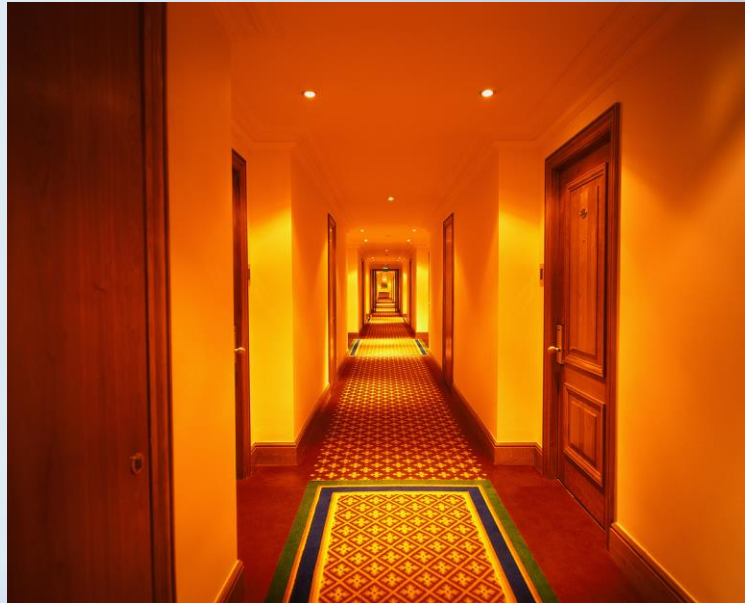 - Vendor/Item maximum months is 3.0

- Minimum = 20 * 2 = 40
  - Plus service level = 40 * 50% = 20
  - Minimum = 40 + 20 = 60
- Maximum = 20 * 3 = 60
  - Plus service level = 60 * 50% = 30
  - Maximum = 60 + 30 = 90

Summary
A simplified approach takes little effort and can yield large returns

- ABC Analysis is simple and easy to use but doesn't solve all issues

- Using MCIC can address many more concerns of the inventory manager

Thank You

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