



Lean And TOC: Leverage The Best Of Both

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& Touche**



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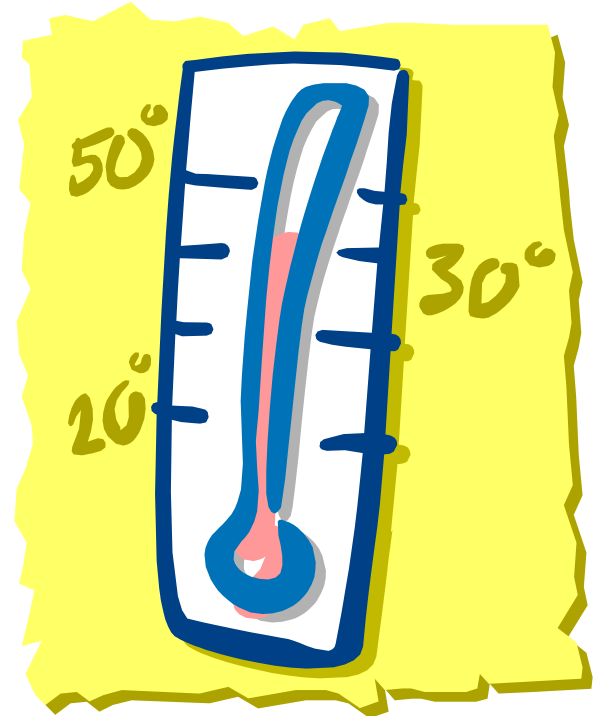
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Lean vs TOC Thermometer

Hits on Google *

1. Just In Time	936,000
2. Total Quality Management	212,000
3. Six Sigma	123,000
4. Lean Manufacturing	54,800
5. Kanban	47,700
6. Theory Of Constraints	14,900
7. Toyota Production System	5,600
8. Drum, Buffer, Rope	1,670

Looks like Lean/TPS is king!



* Informal survey conducted September 23, 2002

Lean vs TOC Thermometer

? # Books on Amazon ? *

- Lean Manufacturing 28
- Theory of Constraints 66



* Informal survey conducted September 23, 2002



Lean And TOC Beginnings

└ In the beginning...

- There was Taiichi Ohno and the TPS
- Then came Jim Womack and *The Machine That Changed The World*
- Books about HOW to do it

└ With Lean Manufacturing, we think of:

- Toyoda Production System
- Functional departments > cells
- Pull system linking operations
- Setup time reduction
- 5S
- Quality



Lean And TOC Beginnings

- ┌ For Theory of Constraints (TOC):
 - Eliyahu Goldratt brought us Alex Rogo in *The Goal*
 - Then came 10 more books by Eli – (fiction!!)
- ┌ With TOC we think in terms of:
 - Maximizing constraints
 - Drum, buffer, rope
 - 5 focusing steps
 - T – OE and I
 - Evaporating clouds, UDEs, reality trees....

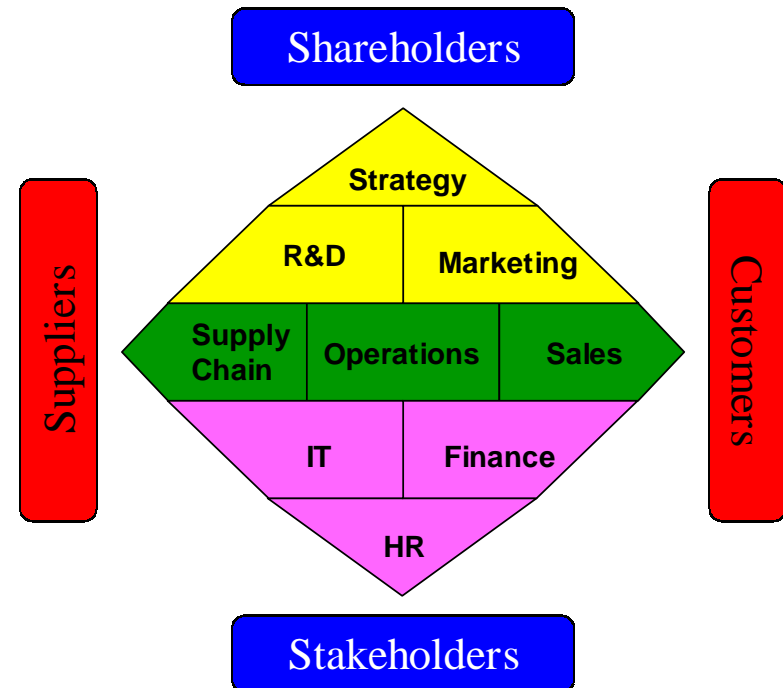
Lean And TOC Beginnings

- While there are many ways to depict each:
- Lean Manufacturing is very manufacturing oriented (Lean Enterprise)
 - Theory of Constraints is very holistic in approach and scope

Lean Manufacturing Practices

Culture	Standards	Flow
Leadership	Standardized Process	Cellular Manufacturing
Employee Involvement	Simultaneous Engineering	Pull Production
Customer Satisfaction	Mistake Proofing	Flexible Operations
Quality	5S Process	Quick Changeover
Visual Control	Total Productive Maintenance	Supplier Co-Destiny
Continuous Elimination of Waste		
Supply Chain and Technology Integration		

TOC Applications





Lean Results

Part Number _____ Description Engine casing Date _____

Operations		Steps	Quantity	Distance	Time (Hrs)	% Time
Operation VA	○	15			0.817	0.13%
Operation NVA	✘	4			0.067	0.01%
Quality	✓	4			0.853	0.13%
Move	⇒	22		29,128	452.25	70.17%
Wait	⌚	2			157.52	24.44%
Store	□	3			33	5.12%
Summary		50	-	29,128	644.507	100.00%



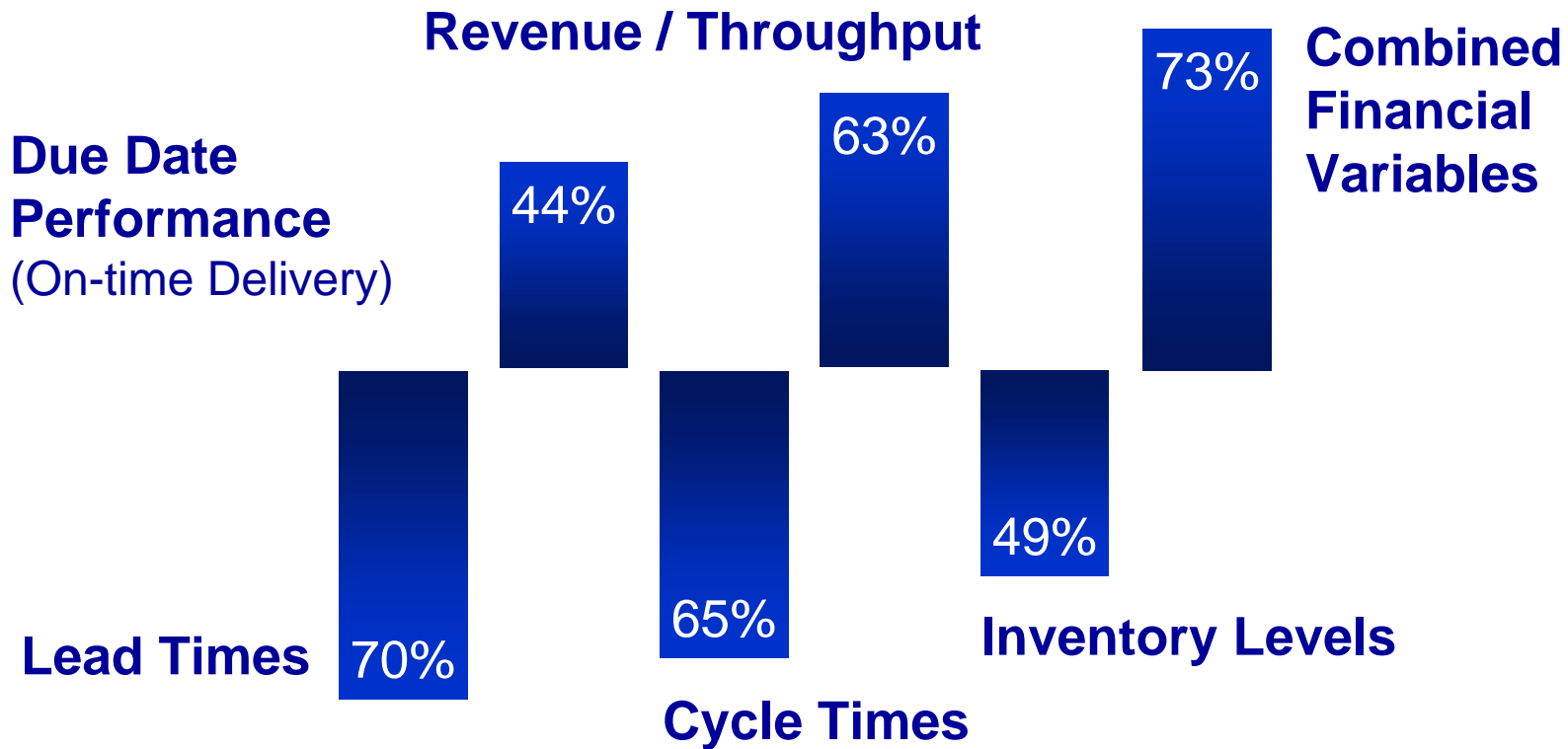
Lean Results

Measure	March	May	% Reduction
● WIP Inventory (pieces)	9,000	1,000	88%
● Throughput Time (hours)	73	0.5	99.7%
● Floor space (square feet)	2,600	1,800	31%
● Distance Traveled (feet)	243	106	56%
● Changeover Time (minutes)	150	16	89%
● First-Run Quality Failures (%)	10.1	2.9	71%



TOC Results

Summary of an Independent Study * *Sampling of Companies Using TOC*



**Source: The World of Theory of Constraints, A Review of the International Literature by V. Mabin and S. Balderstone, St. Lucie Press and APICS*

Managing Constraints

Function	Conflict	Application
Operations	Throughput versus reduce costs	Focus on throughput, profitability will follow
Measures	Cost accounting versus profitability/cash	Performance measures based on T-OE and I
Project Management	Complete each project task on time versus complete the entire project on time	Manage project buffers, not individual task buffers
Supply Chain	Reduce supplier prices versus reduce total supply chain costs	Link suppliers' conflicts with internal core problem
Marketing	Price based on our cost versus customer value	Negotiate agreements to resolve customer's conflict
Sales	Sell based on price/ terms versus customer core conflict	Sell conflict resolution
Human Resources	People as emotional beings versus thinking machines	Use TOC thinking processes
Strategy	Product & market investments versus flexibility	Strategies to open up market constraints



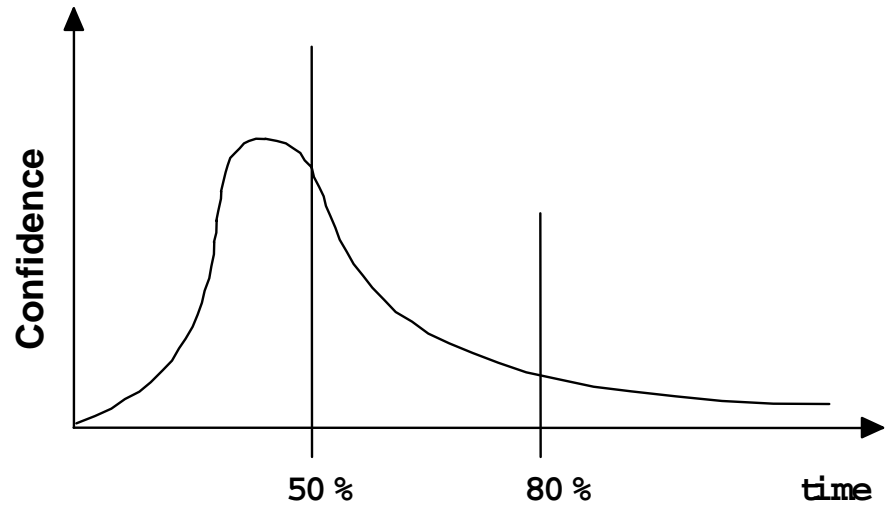
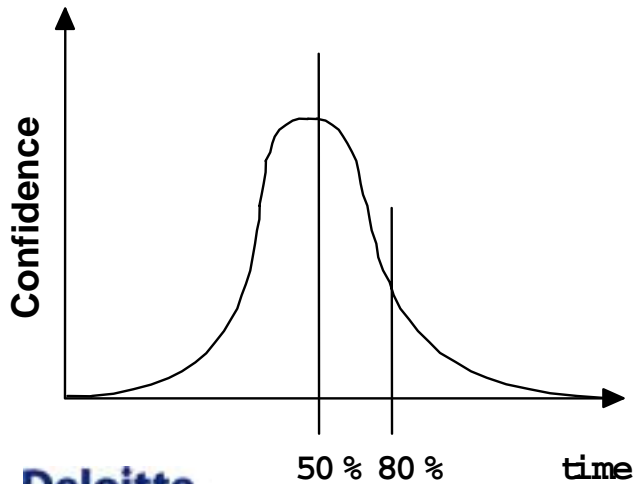
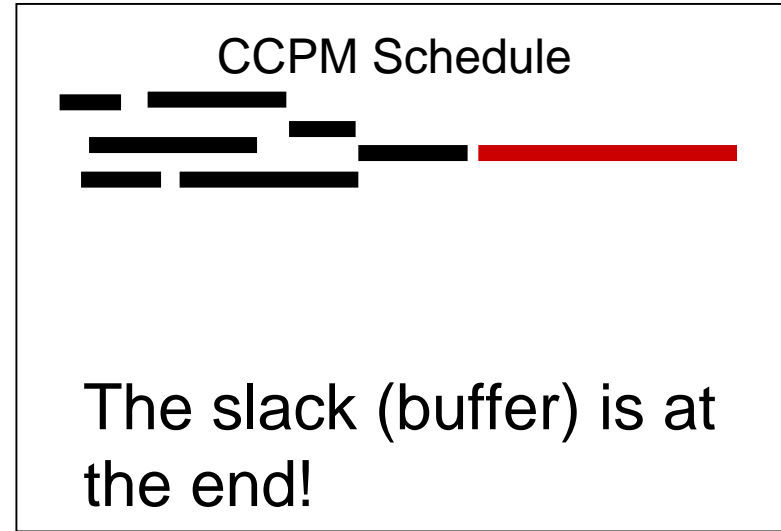
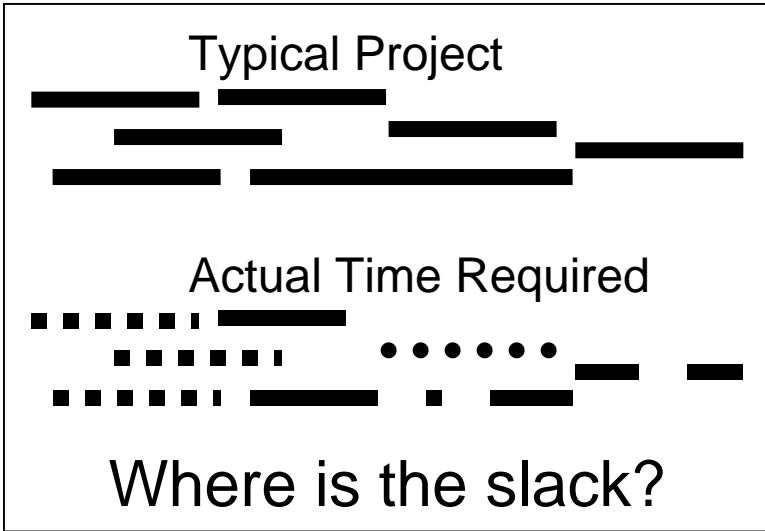
Managing Constraints

Function	Sample Questions and Discussion Points
Operations	Do you attempt to optimize the trade-off of cost (efficiency), inventory and shipments (throughput)?
Measures	Can some results look good even though profit or ROI looks bad?
Project Management	Are most tasks completed on time while projects take too long or are late?
Supply Chain	Can suppliers' contracts be readily compared to insure you are receiving the lowest prices?
Marketing	Is gross margin a key benchmark of customer profitability?
Sales	Do discussions with customers center around price, delivery and quality?
Human Resources	Have your people at times hesitated to provide feedback or input on new ideas and initiatives?
Strategy	Is growth and profitability subject to the swings of the business cycles for your industry?



Managing Constraints

Let's discuss managing projects, policies and critical path:





Executive Alignment

- J Both Lean and TOC have great value for our enterprise
- J Lean brings many specific tools and techniques
- J TOC shines the light on POLICIES to change
- J Consider using the TOC thinking processes to work through issues outside the Lean sweet spot:
 - Conflicts, especially in performance measures
 - Prioritizing areas to emphasize (constraints)
 - Identifying ways to leverage Lean capabilities (marketing/sales tactics)
 - Writing new rules in R&D/projects, supplier relations, supply chain
- J Fall back on the *The Goal* and *Critical Chain*, etc. to sell TOC



Thank You!

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and I will email the
presentation to you!

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