Lean Six Sigma for Service

Combining the Best of Both Worlds to Eliminate Waste in Service Environments!

- Ptacek & Motwani
- MCS Media, 2011
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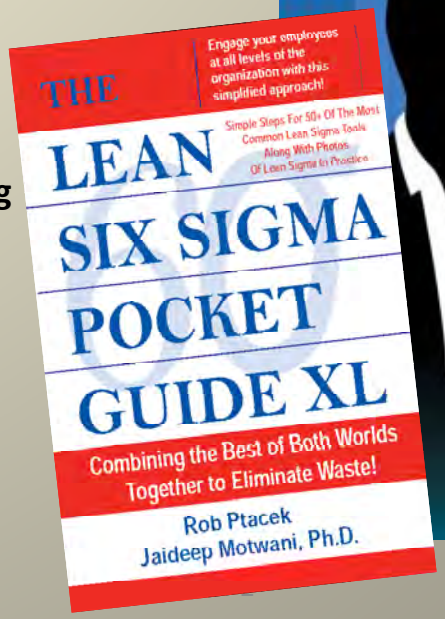

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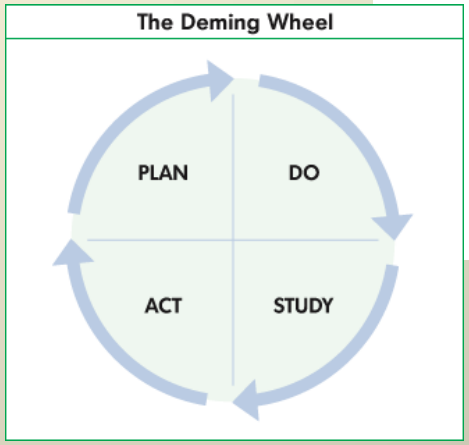
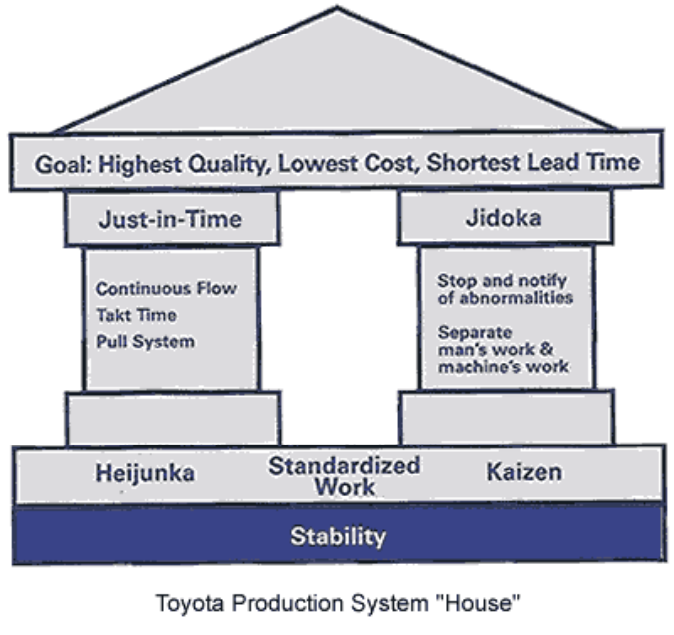
Lean Sigma Manufacturing

Lean Six Sigma Review

What is Lean?

- Minimal Training
- Broad Application
- Positive Impact





Toyota Production System "House"

VA & NVA

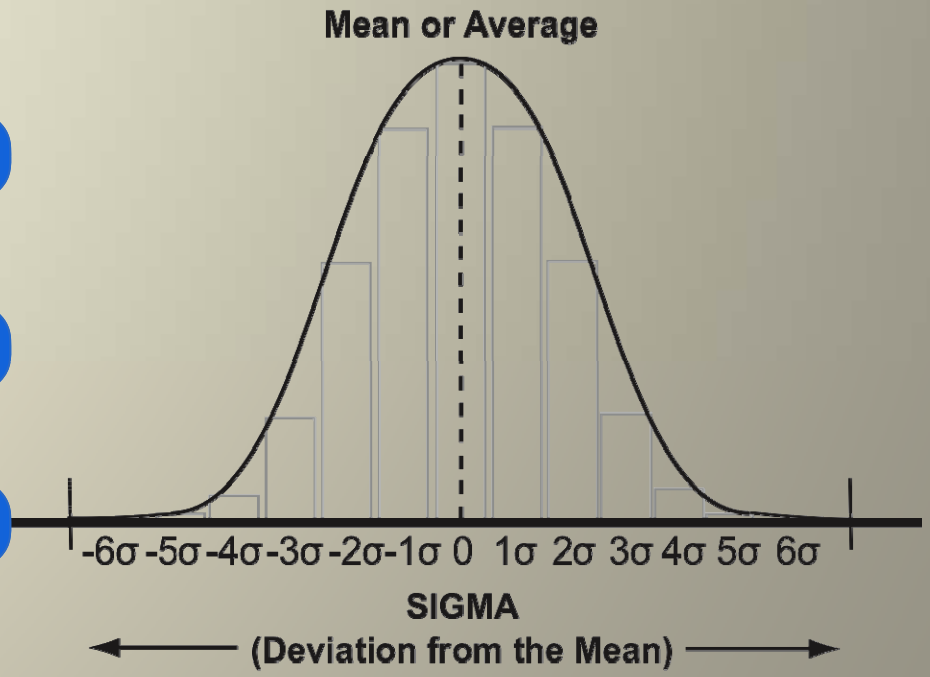
Lean Six Sigma Review

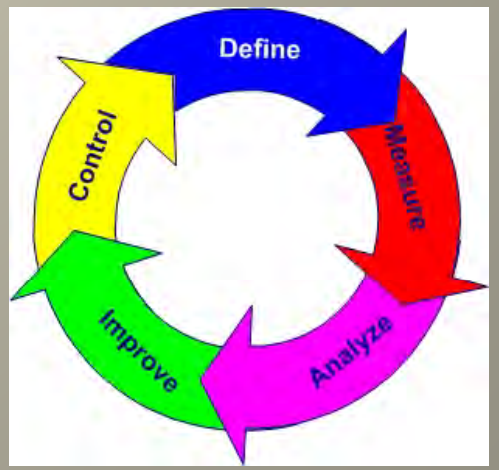
What is Six Sigma?

The Methodology

- Define Phase
- Measure Phase
- Analyze Phase
- Improve Phase
- Control Phase

The Number



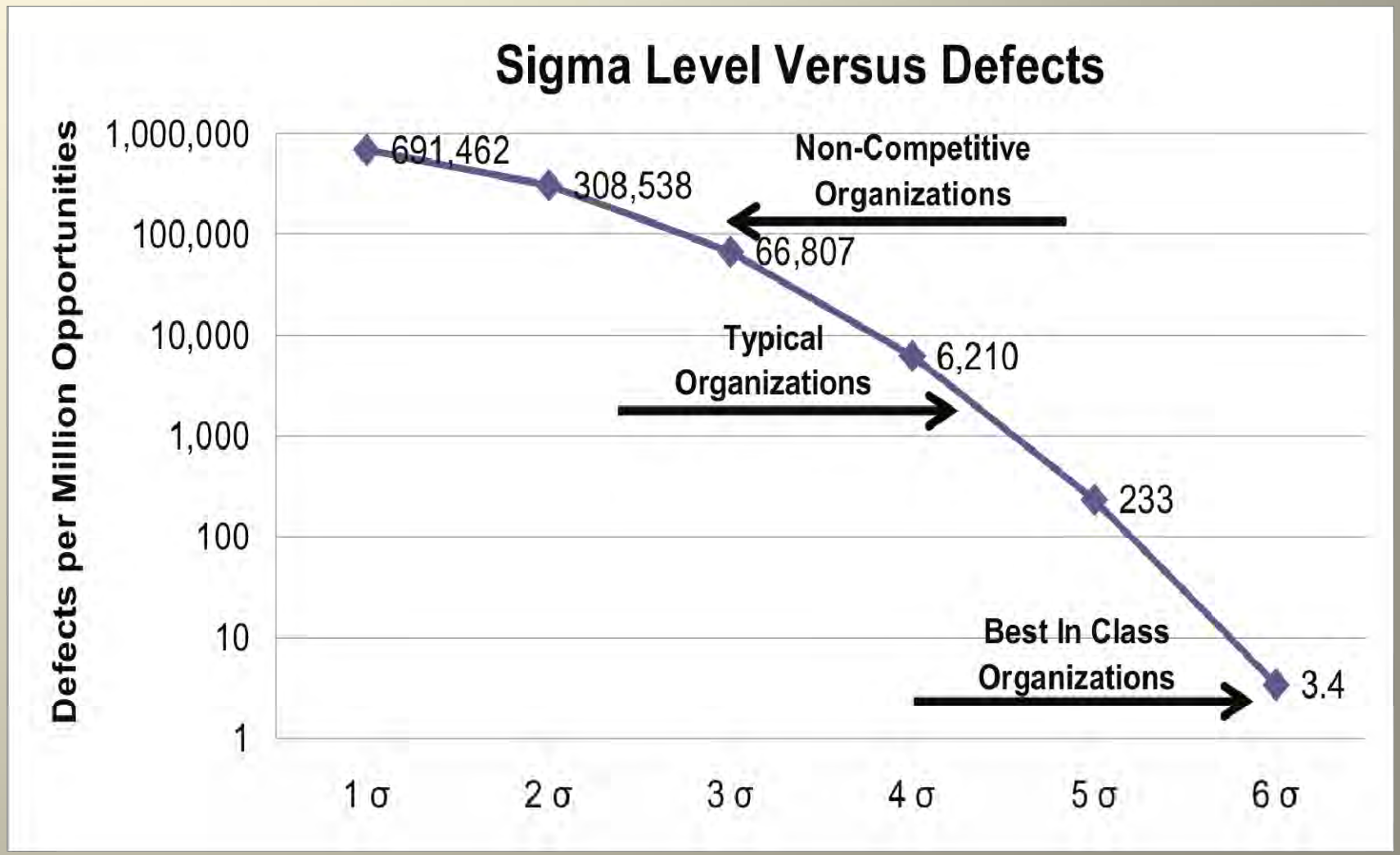


Referred to as the "D-M-A-I-C" process
Analytical and Process focused
(Method and Tools)

Lean Six Sigma Review

What is Six Sigma?

Eliminate defects and minimize variability



Lean Six Sigma Review

What is Lean Six Sigma?

Best of both worlds!

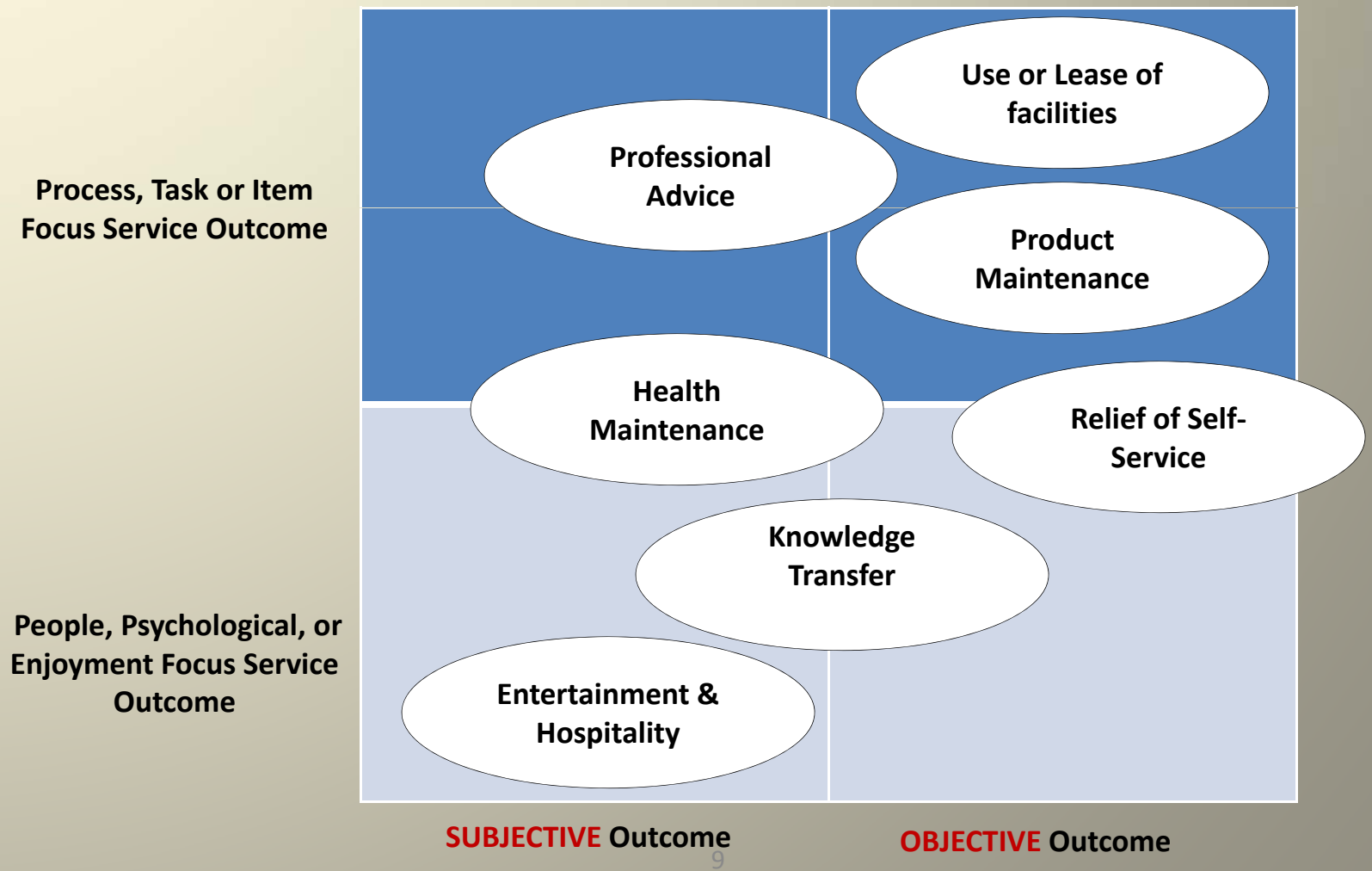
Lean Sigma Office/Administration

Lean Sigma Service

Microsoft Office

What is Service?

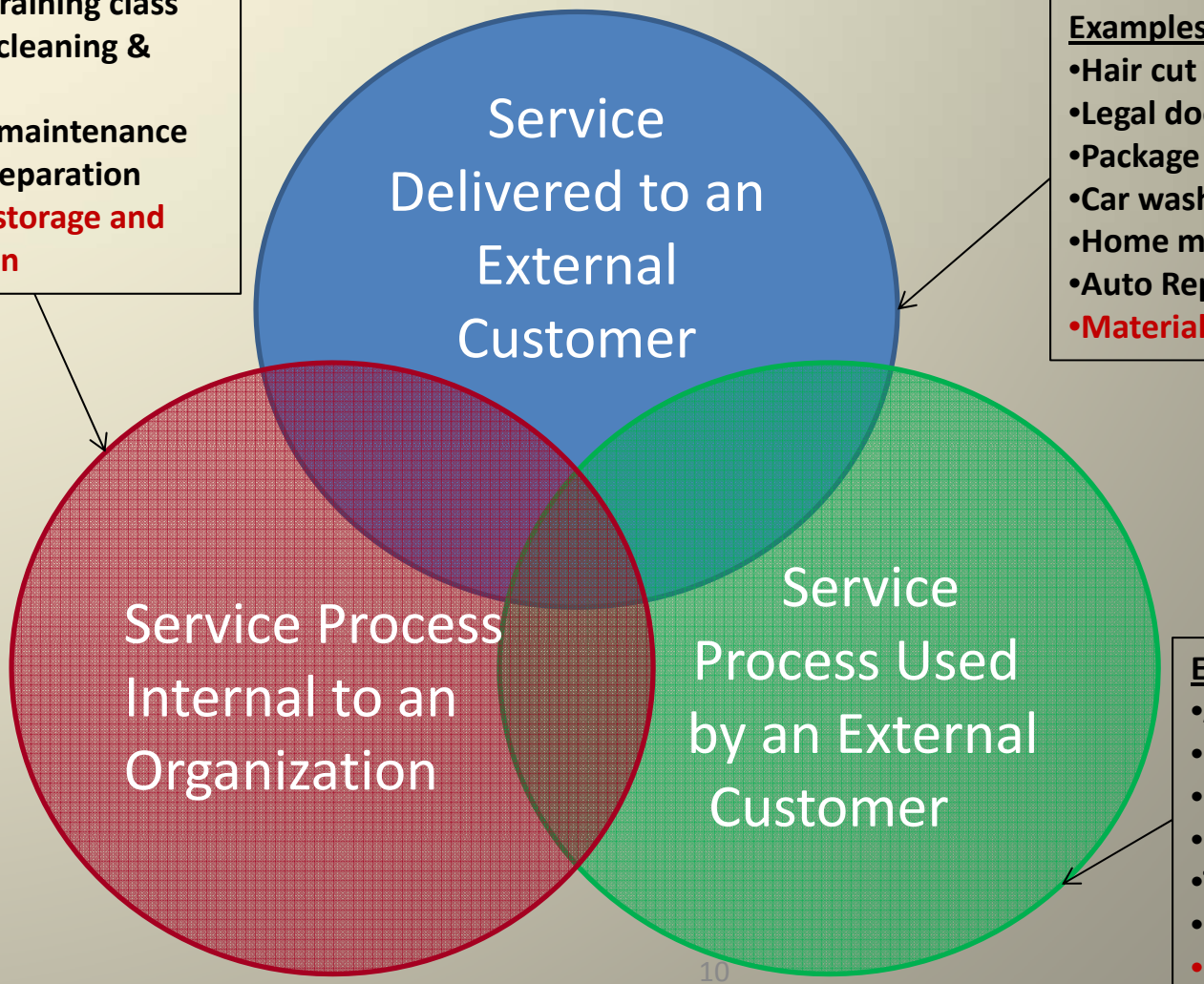
Service *is generally defined as work performed for someone else's benefit or pleasure.*



Service Overview

What is Service?

Examples:
- Payroll processing
- Quality inspection/audit
- Internal Training class
- Machine cleaning & repair
- Building maintenance
- Report Preparation
- Material storage and distribution



Examples:
- Hair cut
- Legal document or advise
- Package delivery
- Car wash
- Home maintenance
- Auto Repair
- Material or goods distribution

Examples:
- Automatic Teller Machine
- Hospital Check-in
- Merchandise return
- Drivers License renewal
- Training class
- Insurance Claim
- Material or goods storage

dcIQ Assessment and Design

Service Case: Distribution Center

2011

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Case Overview

- Introduction: Company & situation
- Approach
- Process and Case Analyses
- Results
- Summary

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Case Overview

- Introduction: Company & situation

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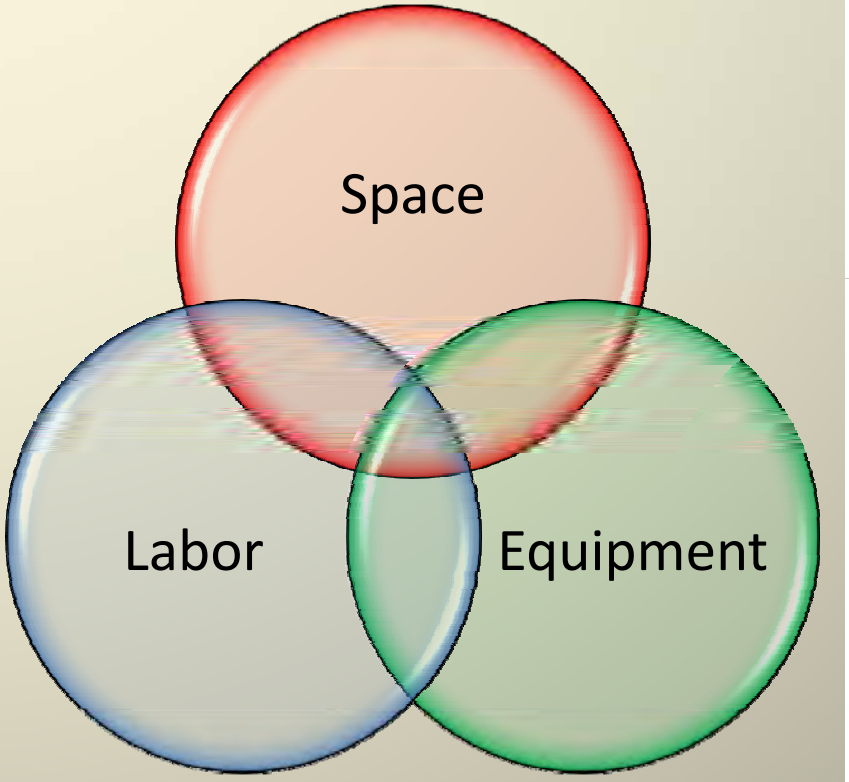
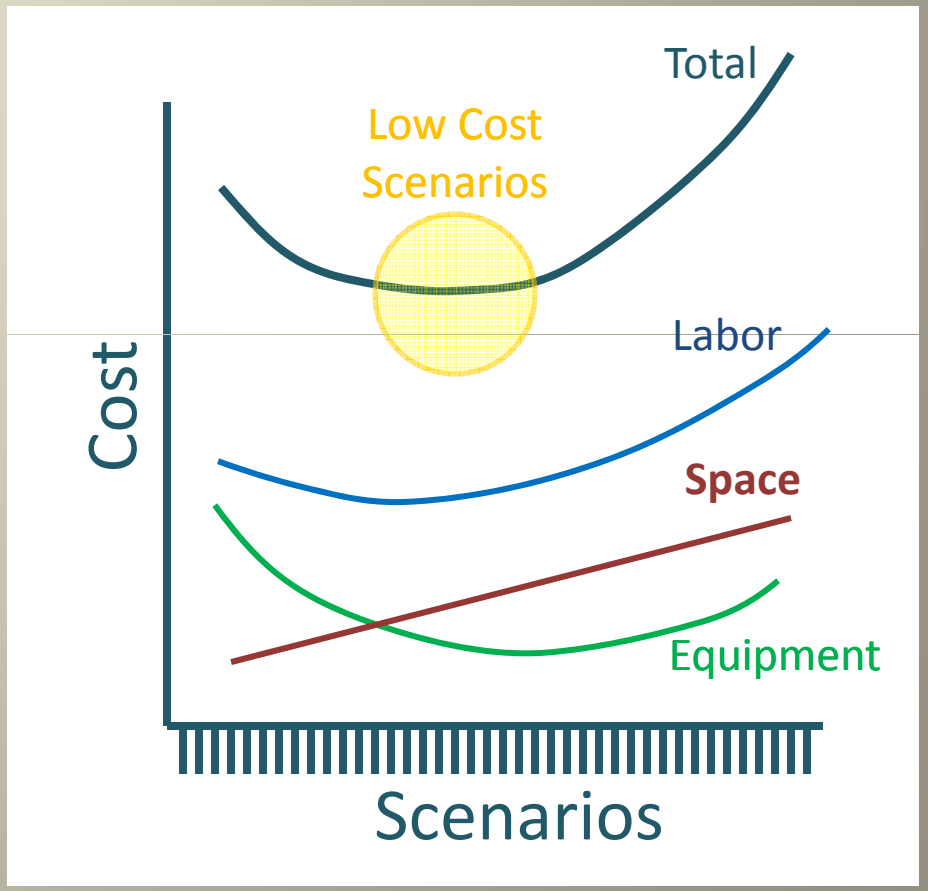
Lean Sigma Approach & Power Tools





Map all combinations of costs in order to find the one best way

Assessment Approach

Objective	Evaluate the current operation to determine improvement opportunities		
Approach	Walk-through Apply consultant expertise to a visual inspection of the current operation	Benchmark Compare current data to industry standards	dcIQ Apply current data to all combinations of space, labor and equipment
Result	Feasible and infeasible improvements with no business case	Standardized opportunities that might apply to the operation	Implementable changes with quantified savings and costs
Output	Written report	Quantified comparison of current operation to standards	**Simulation with combinatorial analysis**
Timing	3 – 5 days	2 – 12 weeks	**2 – 3 weeks**

Design Approach

Objective	Develop a facility layout that meets service, volume and budget requirements	
Approach	**Traditional** Create example layouts based on • Current operation • Industry example • Designer experience	**dcIQ** Develop least cost strategy derived from all combinations of space, labor and equipment
Result	Functional design based on 2 – 3 layout alternatives	Design that achieves lowest cost per unit throughput
Output	Asset application	**Least cost strategy**
Timing	12 – 14 weeks	**8 – 12 weeks**

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Case Process

1. Collect Operational Data

2. Create Design Criteria

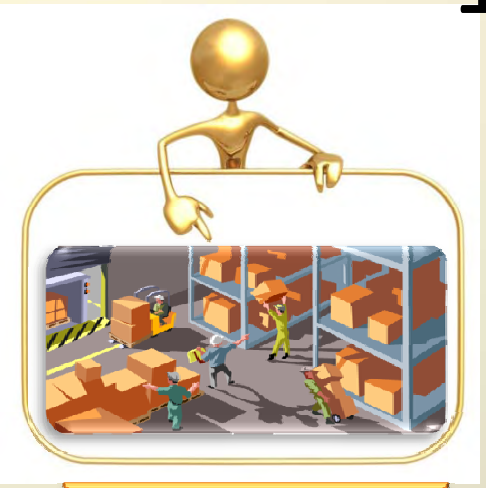
3. Validate Design Criteria

4. Evaluate Scenarios

5. Approve Action Plan

Typical assessment takes 2 – 3 weeks; design takes 8 – 12 weeks

1. Operational Data

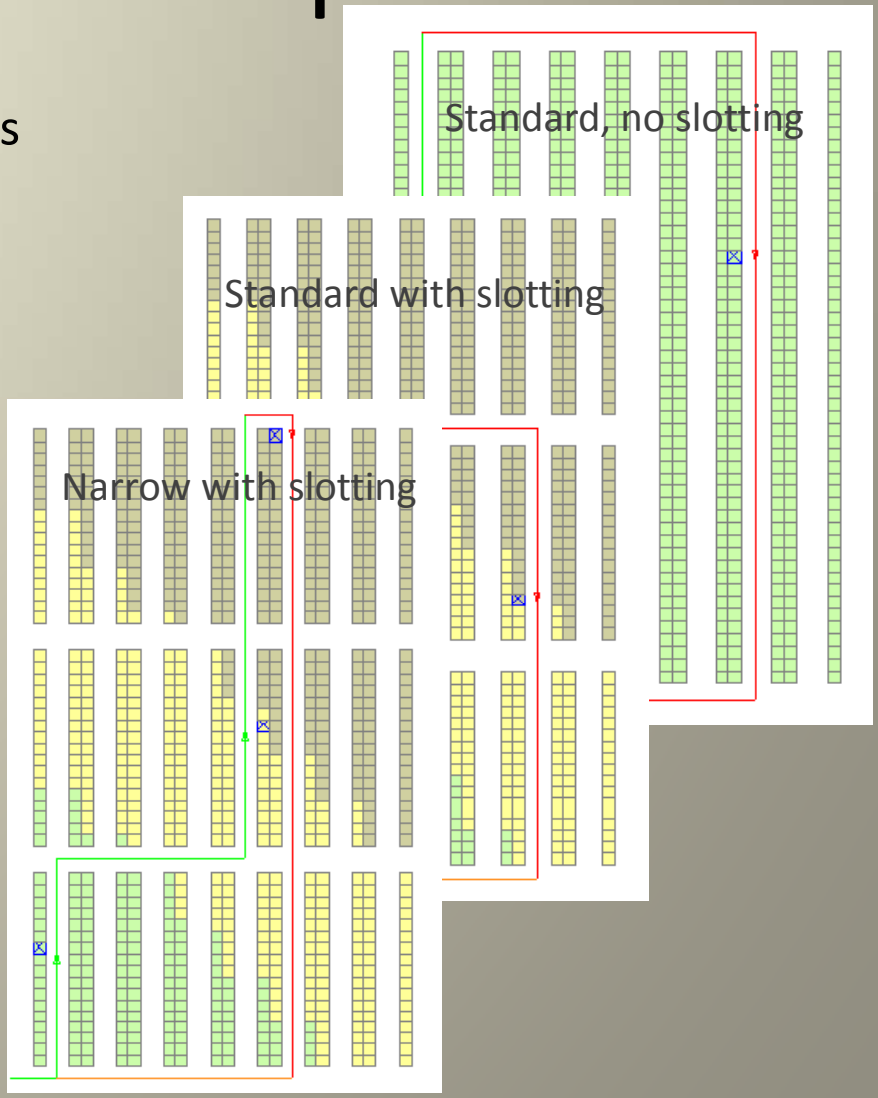


Assessment and design starts with compiling over 140 data points related to the facility's costs, service and policies

- Order volume and characteristics
- Inventory characteristics
- Operations
  - Labor cost
  - Operating policies
  - Other
- Cost drivers
  - Demand
  - Operating strategies

2. Design Criteria: Space

- Building dimensions
- Column width
- Aisle type
- Storage height
- Storage media
- Opportunistic storage
- Cost drivers
  - Travel distance
  - Space utilization



Evaluate opportunities related to aisle type, slotting and storage media

2. Design Criteria: Flows

- Processes
  - Unloading
  - Put away
  - Picking
  - Loading
  - Others
- Horizontal distance
- Vertical distance
- Cost drivers
  - Frequency of flow
  - Distance
  - Flow capacity

Evaluate flows to generate scenarios for equipment, slotting and layout

2. Design Criteria: MHE

Compare the impact of over 25 types of material handling equipment

- Type
  - Hand jacks
  - Riders
  - Counterbalance
  - Other
- Capability
  - Aisle width
  - Reach height
  - Other
- Cost drivers
  - Capital
  - Speed
  - Capacity
  - Utilization

3. Validate Criteria

- Labor Costs
- Building Specs
- Volumes
- Distances
- MHE Assumptions
- Outcome
  - Current state
  - Platform for analysis

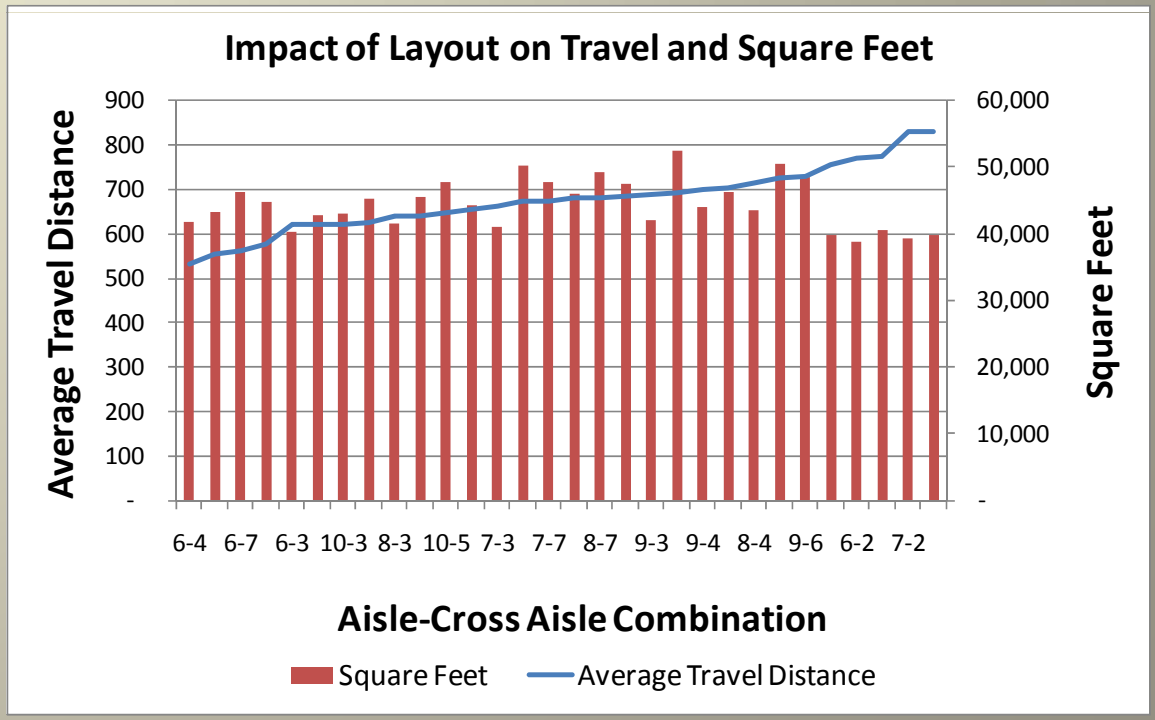
We confirm the data with you before proceeding with the analysis

4. Evaluate Scenarios: Layout

- Space requirements
- Least travel

- Outcome
  - Best aisle configurations
  - Best travel distances
  - Best labor utilization

Compare the operational and cost impact of all possible layout solutions

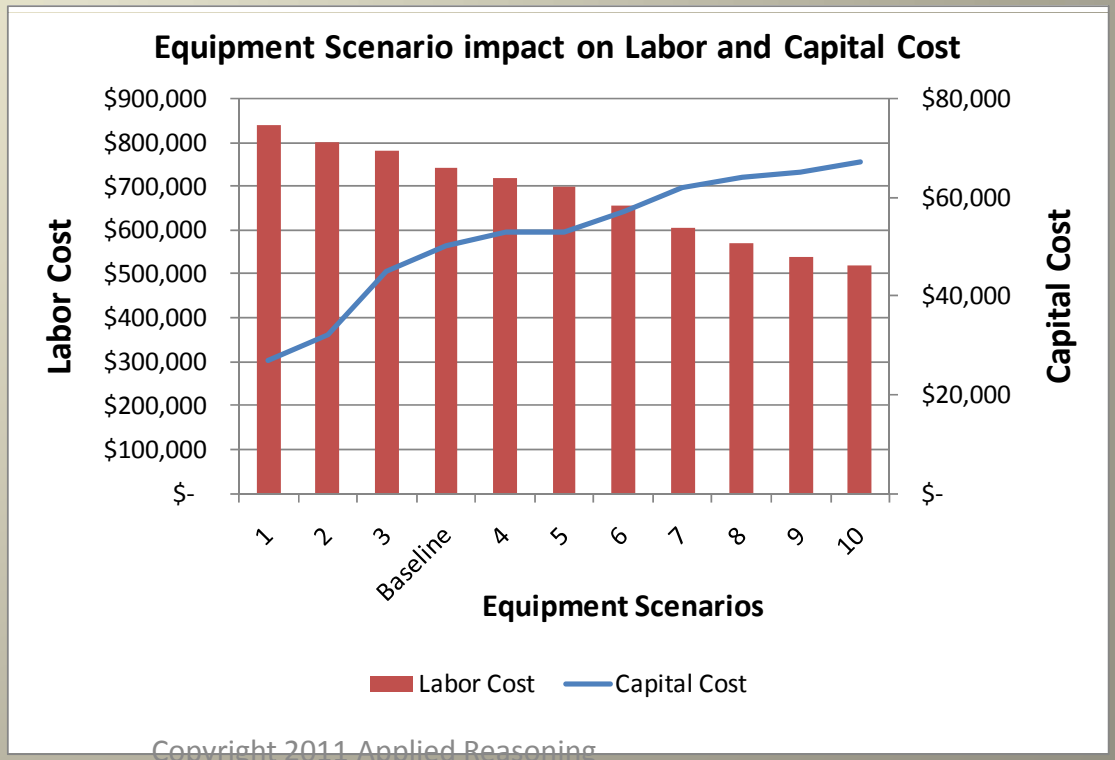


4. Evaluate Scenarios: MHE

Compare MHE speeds and capacities to your facility's flows

- Least capital solution
- Least labor solution

- Outcome
  - Capital/total cost trade-off
  - Best labor and equipment utilization



5. Action Planning

- Speed to implement
- Value add
- Capital requirements

- Outcome
  - Sequenced change
  - Timeline
  - Budgeted savings

dcIQ provides enough detail to prioritize specific opportunities or proceed to full facility re-design

	Opportunity	*Description*	*Savings*	*Capital*	*Speed*
1	Overdock	Opportunity storage	$ 5,000	$ -	30 days
2	Aisle width	Reduce over-size aisles	$ 45,000	$ -	60 days
3	MHE-picking	Use 96" forks	$ 76,000	$ 3,000	30 days
4	MHE-unloading	Use counterbalance	$ 63,000	$ 35,000	90 days

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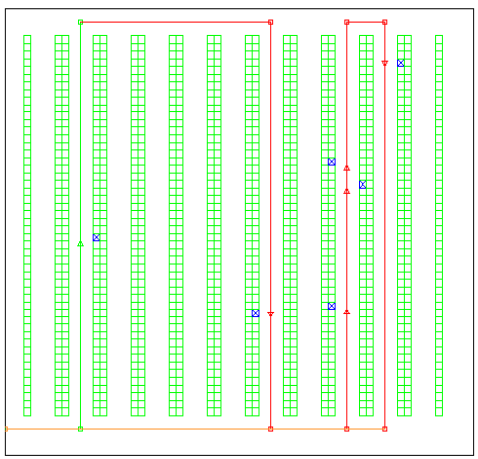
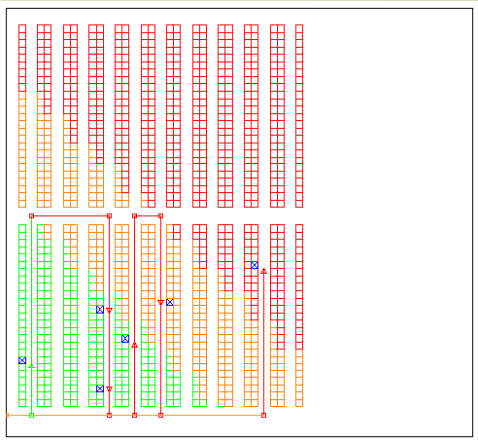
Results: Case Study

Baseline Layout



Future Layout



	Baseline	***Future***	***Savings Drivers***
Space	• 70,000 square feet • Standard aisle width • No slotting	• 50,000 square feet • Narrow aisle • ABC slotting	Reduced cost of space and travel distances
Material Handling	• 4 sit-down counterbalance • 6 reach trucks	• 2 sit-down counterbalance w/double length forks • 4 reach trucks	4 fewer units and batteries
Staffing	• 10 full time employees • 10% overtime	• 7 full time employees	Staff reduction of 3 with overtime reduced to zero

Budget	***Baseline Cost***	***Future Cost***	***Savings***	***%***
Space	$ 280,000	$ 200,000	$ 80,000	29%
Equipment	$ 336,000	$ 144,000	$ 192,000	57%
Staffing	$ 272,000	$ 136,000	$ 136,000	50%
Overhead	$ 165,000	$ 165,000	$ -	0%
Total Annual Cost	$ 1,053,000	$ 645,000	$ 408,000	39%

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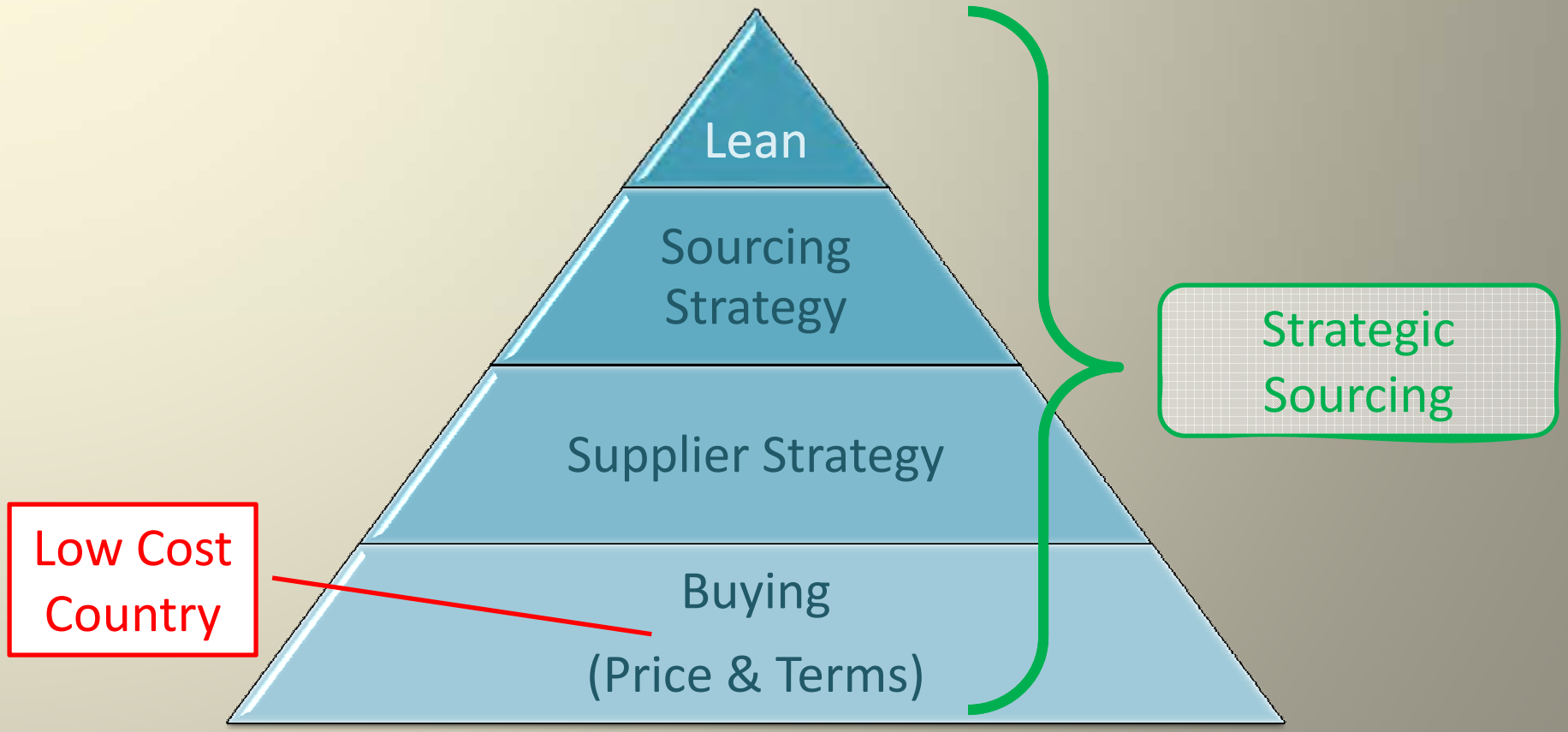
Next Steps: Strategic Sourcing



"Low cost country" is tactical buying with a focus on piece price

"Strategic sourcing" uses a broader approach with a focus on total landed cost

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Questions and Discussion?

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