LAI Lean Academy™

A3 Thinking

Learning Objectives

At the end of this module, you should be able to:

- **Recognize that A3 is a way of thinking and not just a tool**
- **Use the A3 chart as a standard tool for implementing lean projects**

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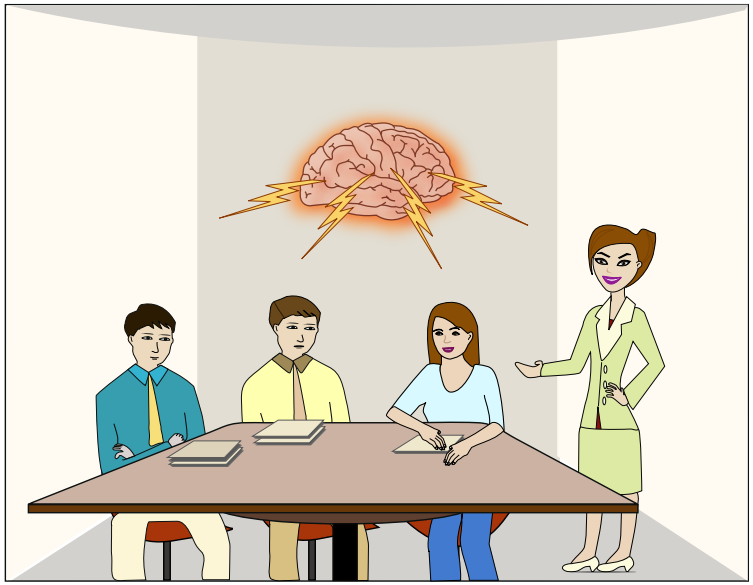
A3 Enables PDSA



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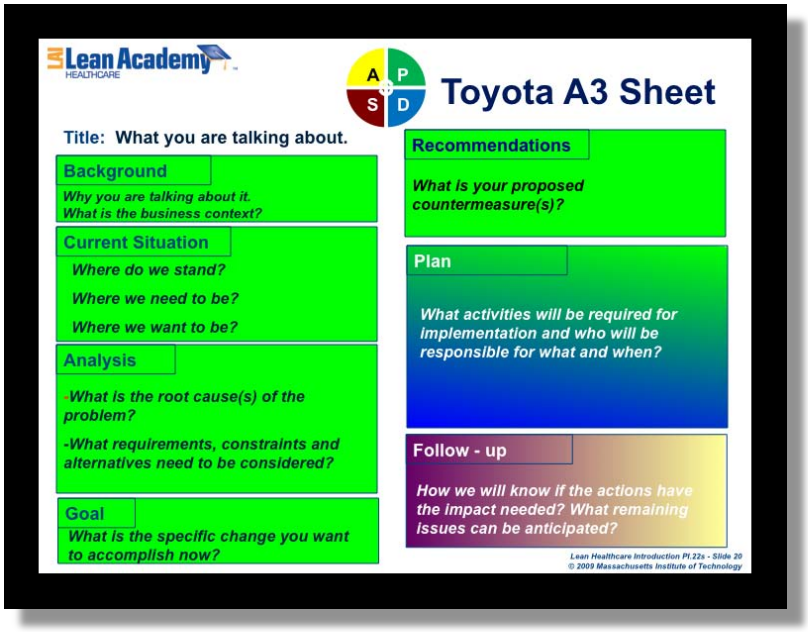

- **Both a *way of thinking* and a *tool***
- **A management process evolved at Toyota**
- **Named for the A3 sheet of paper (similar to 11” x 17” US Ledger paper)**

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Toyota A3 Sheet

Title: What you are talking about.

Background

Why you are talking about it.
What is the business context?

Current Situation

Where do we stand?

Where we need to be?

Where we want to be?

Analysis

-What is the root cause(s) of the problem?

-What requirements, constraints and alternatives need to be considered?

Goal

What is the specific change you want to accomplish now?

Recommendations

What is your proposed countermeasure(s)?

Plan

What activities will be required for implementation and who will be responsible for what and when?

Follow - up

How we will know if the actions have the impact needed? What remaining issues can be anticipated?

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A3 Thinking

The thought process used is paramount to the tool (A3 Report)

It is a *collaborative* problem-solving method

It promotes:

- **Logical, objective (data-driven) thinking**
- **Results and process**
- **Synthesis, distillation, and visualization**
- **Alignment**
- **Coherence within and consistency across**
- **Systems perspective**

References: Sobek, Durward K., Smalley, Art., (2008). *Understanding A3 Thinking: A Critical Component of Toyota's PDCA Management System*. Boca Raton: Productivity Press, Taylor & Francis Group

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Current Situation

Title: What you are talking about.

Background

Why you are talking about it.
What is the business context?

Current Situation

Where do we stand?

Where we need to be?

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Analysis

-What is the root cause of the problem?

-What requirements, constraints and alternatives need to be considered?

Goal

What is the specific change you want to accomplish now?

Diagrams

- *Efficient means for communication*

Useful questions*:

- *Are activities clearly specified with regard to content, order, and intended outcome?*
- *Are the connections between entities clear & explicit?*

* Spear, S and Bowen, K, "Decoding the DNA of the Toyota Production System

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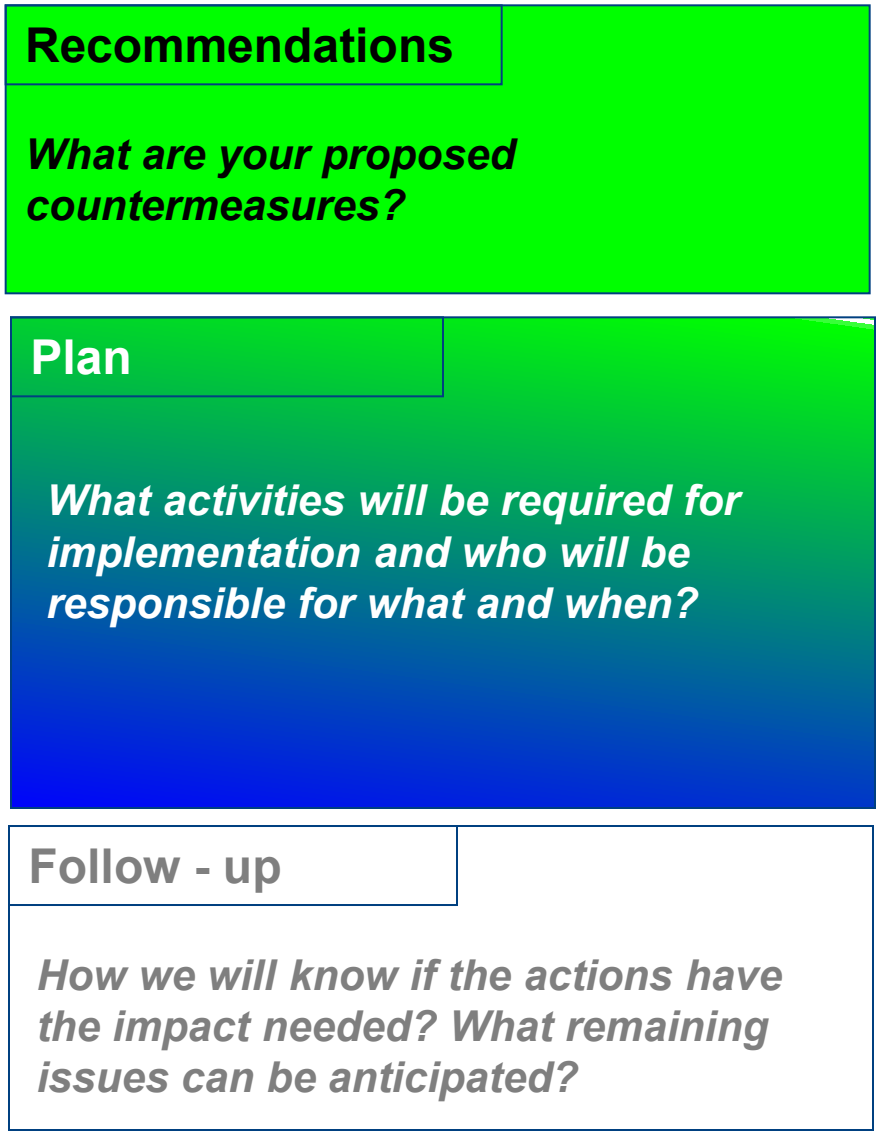
Countermeasures

Recommendations

- Directly address the root cause
- Should move the process from the current toward the ideal state

Plan

- Define steps to correct each cause
- Identify responsibilities, dates, details
- Use GANTT Charts, tables



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Continuous Improvement

Follow-Up

- Link back to goals/criteria
- Time-based charts can show changes

Recommendations

What are your proposed countermeasures?

Plan

What activities will be required for implementation and who will be responsible for what and when?

Follow - up

How we will know if the actions have the impact needed? What remaining issues can be anticipated?

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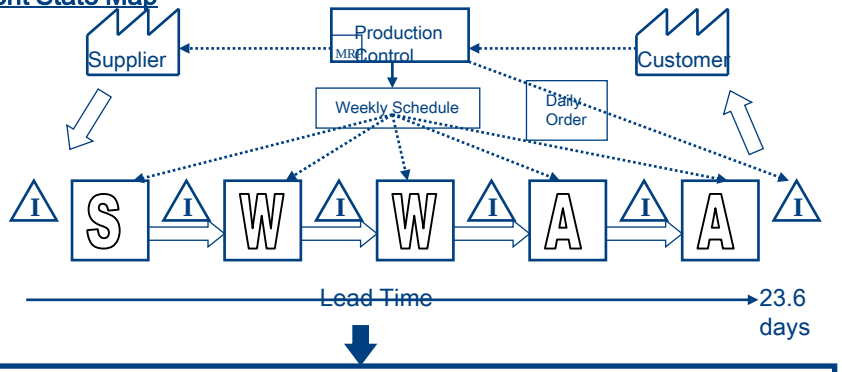
A3 Example

Acme Stamping Steering Bracket Value Stream Improvement

Background
- Product: stamped-steel steering brackets (left- and right-hand drive).
- 18,400 brackets/month; daily shipments in pallets of 10 trays of 20 brackets.
- **Customer State Street Assembly is requesting price cuts and tightening delivery requirements.**

Current Situation
- Production Lead time:23.6 days
- Processing time: only 188 seconds.
- Large inventories of material between each process.
- Long changeover times; downtime in welding.

Current State Map



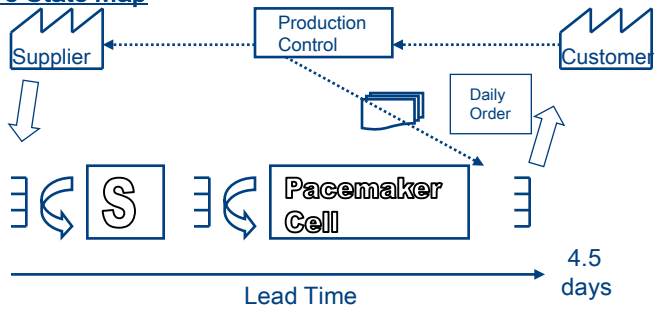
Analysis
- Each process operates as isolated islands, disconnected from customer.
- Push system; material builds up between each process.
- Each process builds according to its own operating constraints (changeover, downtime, etc.
- Plans based on 90 and 30-day forecasts from customer. Weekly schedule for each department. System is frequently overidden to make delivery.

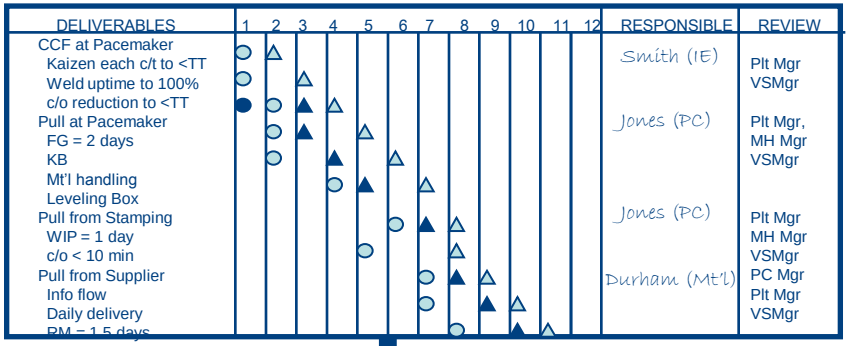
Goals: Improve profitability while meeting tougher customer demands:
- Reduce lead time – 23.6 days to ≤5 days
- Reduce inventories: Stamping – ≤2 days
  Welding – Eliminate
  Shipping – ≤2 days

Source: Verble/Shook 12/6/01

Counterrmeasures :
- Create continuous flow in through Weld and Assembly
- Establish Takt Time: Base the pace of work through Weld and Assembly on customer demand
- Set new Weld-assembly cell as pacemaker for entire value stream
- Establish EPEX build schedule for stamping based on actual use of pacemaker cell and pull steel coils from supplier based on actual usage by Stamping.
- Reduce Changeover time in Stamping and Weld
- Improve uptime in Weld
- Establish material handling routes for frequent withdrawal and delivery
- Establish new production instruction system with Leveling Box

Future State Map





Follow-up
Confirm reviews and involvement of related departments:
Production Control and Material Handling, Purchasing, Maintenance, Human Resources, Finance.

Courtesy of John Shook. Used with permission.

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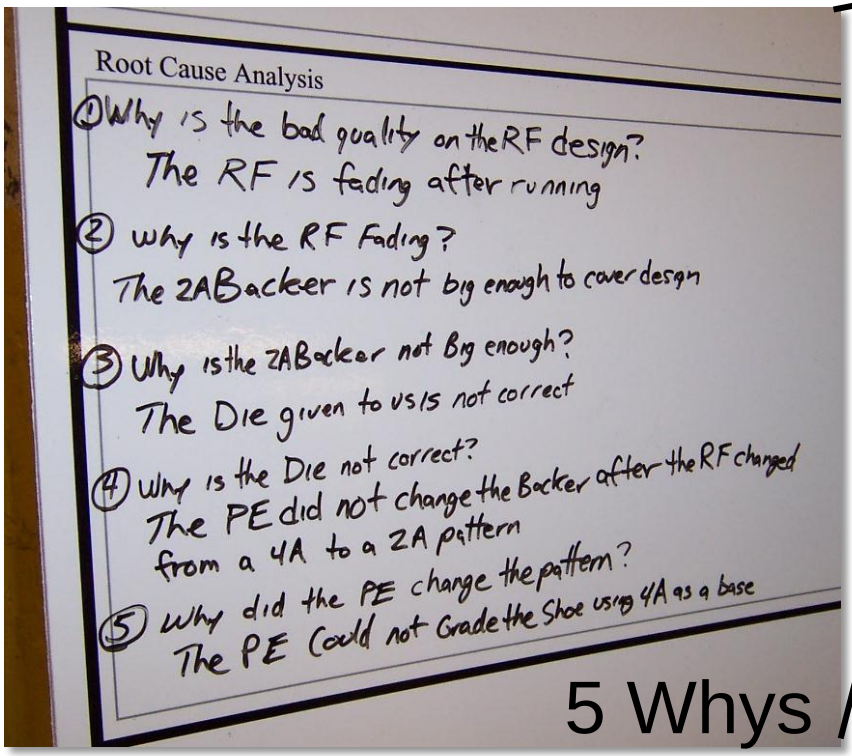
A3 In The Gemba

"Problem Solving Thinking Form"



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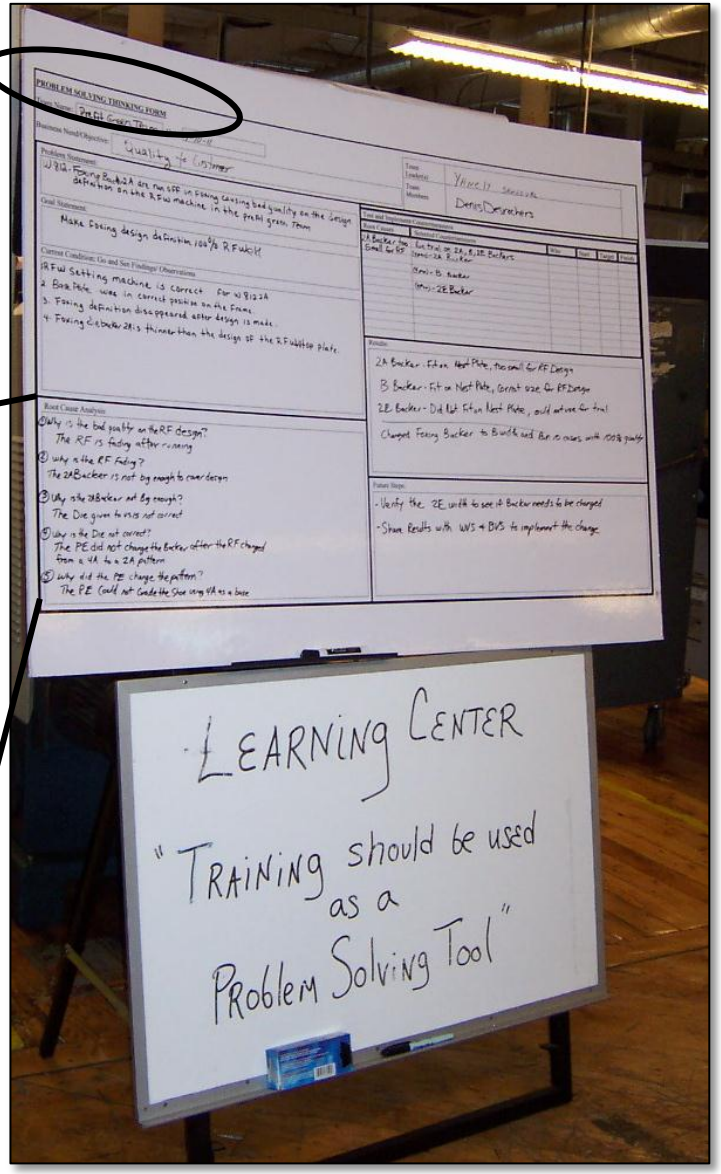

Photos by Earll Murman

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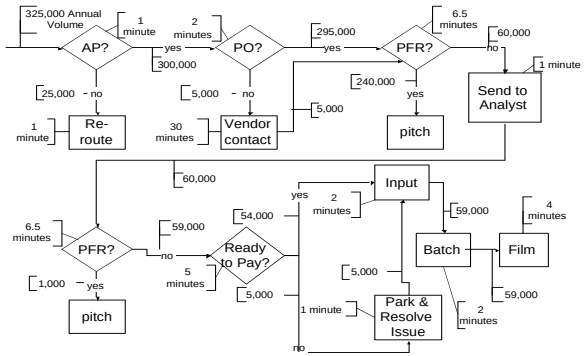
Rockwell Collins Accounts Payable A3 Sheet

Background
- Switched to PFR system in 1993
- 80% of suppliers on PFR
- Problem is processing remaining invoices

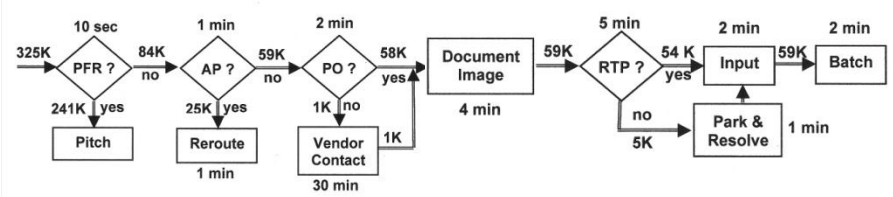
Current Situation
- 6.4 wks avg cycle time for invoices & growing
- 12% past due payments and growing.
- Mailroom does not catch all PFR invoices
- 16 AP staff each have own groups of suppliers

Current State Value Stream Map



Courtesy of Phil Jones, Sylvia and Clement T. Hanson Professor of Manufacturing Productivity, Tippie School of Management, The University of Iowa. Used with permission.

Recommendations:
- Add XXXXX to PFR invoices
- Use document imaging for invoices received
- Establish queued call center using Lotus Note
- Train purchasing, receiving, AP personnel



Analysis
- AP staff workload is 95.8%
- 42.7% analyst time spent on PFR related tasks
- Activity Time/Total Flow Time = 0.0014

Goal: Process invoices in 10 days or less
- No staff increase, no new software systems
- Establish training & communication plans

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A3 Exercise

Join your AP Case Study team

Develop an A3 plan to respond to Question 8

- *"Suppose your are the RPI team leader and have to report back to Joanie. What will you recommend?"*

Spend 20 minutes preparing your A3 plan

- Recall the management constraints (next slide)
- Consider what RC groups would participate in RPI team
- Verify that the provided information is correct
- Complete **the additional information blocks**
  - Use postit notes on large A3 for draft plan elements
  - Record final recommendations on large A3 sheet

Be ready for class review of your A3 plan

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Management Constraints

Recall the constraints given by management

- Main objective is reduction of cycle time
  - Invoice resolution less than 10 days, shorter is even better
- Establish a training program for everyone effected by the change
- Formalize communication requirements for invoice payment with suppliers
- Changes must be accomplished within current SAP system
- Use already available in house software or IT technology
- Action items to be completed within 30 days
- No additional staff can be authorized

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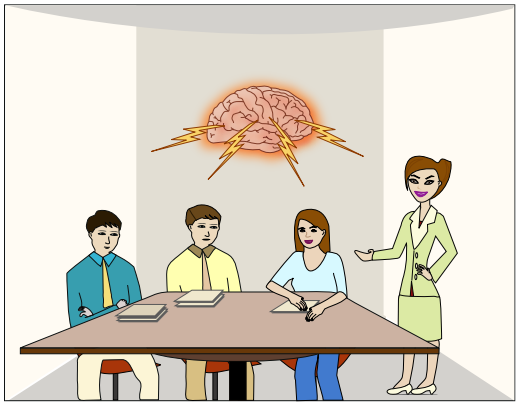
Wrap Up

- A3 is both a way of thinking and a tool.
  - A3 process can be used to initiate a discussion around problems & possible solutions
  - A3 thinking can anchor a continuous improvement – and a continuously learning – culture
- A3 represents a standard problem solving process that can be used by all workers to become problem solvers all the time.



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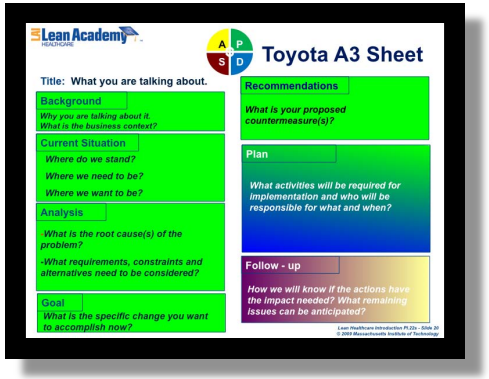

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Reading List

Jimmerson, Cindy. *A3 Problem Solving for Healthcare: A Practical Method for Eliminating Waste*. Productivity Press, Boca Raton, FL. 2007

Shook, John, *Managing to Learn: Using the A3 management process to solve problems, gain agreement, mentor, and lead*, Lean Enterprise Institute, Cambridge, MA 2008

Sobek, D. K., Smalley, A. *Understanding A3 Thinking: A Critical Component of Toyota's PDCA Management System*, Productivity Press,. Boca Raton, FL. 2008

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Acknowledgements

Contributors

- Jackie Candido – MIT EdNet
- Earll Murman – MIT
- Steve Shade – Purdue University

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16.660J / ESD.62J / 16.853 Introduction to Lean Six Sigma Methods

IAP 2012

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