

lean summit 2008

Lean Tools to Lean Management

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A Short History of Lean

Elements of Any Value Creating Enterprise

1. Product and process development, from concept to launch.
2. Supplier management, in a de-integrated world.
3. Customer support, from initial interest in a product through its use cycle.
4. Fulfillment, from order to delivery.
5. Enterprise management, to decide what is important and engage people to achieve it by transforming, sustaining, and improving 1 - 4.

The Ages of Management: Craft

We've been on a long journey:

- Starting eons ago with Craft Production:
 - ✓ Product development by one person.
 - ✓ Production by the master craftsman (same person.)
 - ✓ Labor from apprentices, using flexible machines.
 - ✓ Parts supplied by other small craftsmen.
- Worked for simple products in low volumes.

Henry Ford

- Small, fast development team, led by Ford himself.
- Standard, low-cost product, no options.
- Interchangeable parts, every time – no fitting.
- Flow production in assembly.
- Flow production in fabrication, by locating different technologies in process sequence.
- Standard work.
- Primitive pull system.
- Remarkably “horizontal” organization.
- Brilliant initial success and brilliant prospects in 1914!

What Ford Left Out: Variety & Management

- Ford truly believed everyone wanted the same thing.
- Loved by Fascists and Communists alike because this belief facilitated top-down, command-control “Planning”.
- No model of management other than referring all decisions to the top. (No clear grants of authority.)
- Worked when there was only one value stream for a standard product!
- Declined steadily as markets demanded variety and company became increasingly impossible to control.

Alfred Sloan & Management by Metrics

- “A product for every purse and purpose.”
- A management system with:
 - ✓ Clear grants of authority, for organizational units.
 - ✓ Planning and direction from the top down.
 - ✓ Line managers judged on results, increasingly financial.
 - ✓ Generalist managers, rotated frequently.
 - ✓ Decisions made far from point of value creation, by analyzing data.
 - ✓ Problem solving and improvements conducted by staffs and through programs.
 - ✓ Loss of Ford’s focus on horizontal flow of value.

Eiji Toyoda & Management by Process

- Planning and direction from top but with multiple feedback loops
- ✓ **Responsibility** for getting problems solved through improved processes takes precedence over **authority** for departments and functions.
- Line managers focused on operating and improving clearly specified processes.
- Good results emerge from average people operating and improving brilliant processes rather than brilliant heroes focusing on results by working around broken processes.

Eiji Toyoda & Management by Process

- Decisions made as close to the point of value creation as possible, using direct observation; turning “data” into “facts.”
- Problem solving and improvement conducted mostly by mid-level/line managers, in problem solving loops with superiors and subordinates.
- Remarkable horizontal focus in a vertical, functional organization!

Remember: Value flows horizontally across the enterprise to the customer but practically all organizations (including Toyota) are vertical with knowledge, assets, careers, and authority organized by departments and functions.

Ages of Lean: Invention & Innovation

- Creation of the initial lean enterprise, 1937 to 1977:
 - ✓ Product and process development, Kenya Nakamura
 - ✓ Supplier management, Kiichiro Toyoda?
 - ✓ Customer management and support, Shotaro Kamiya (deployed in Japan only)
 - ✓ Fulfillment, from order to delivery (TPS), Taiichi Ohno
 - ✓ Enterprise management, Eiji Toyoda

Ages of Lean: Discovery

- 1977-1990:
 - ✓ Cho et al TPS article in English engineering journal.
 - ✓ Pilgrimages to Japan.
 - ✓ Proof of concept in a new environment:
Kawasaki in Nebraska, Honda in Ohio, NUMMI in California, Toyota in Georgetown.

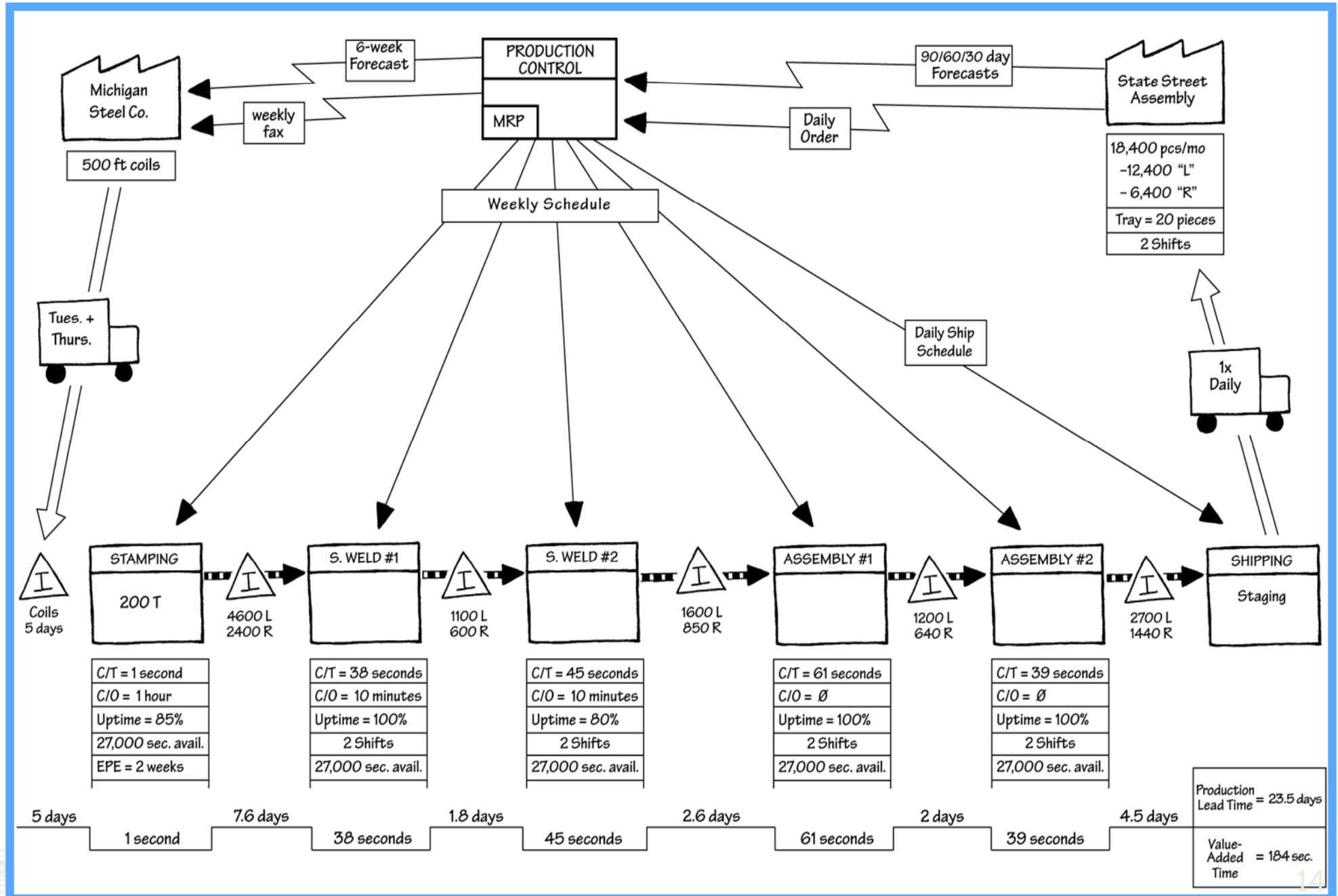
Ages of Lean: Diffusion Beyond Auto

- >1990 and accelerating today:
 - ✓ Aerospace in early 1990s.
 - ✓ Healthcare from mid 1990s.
 - ✓ Retail and distribution from later 1990s.

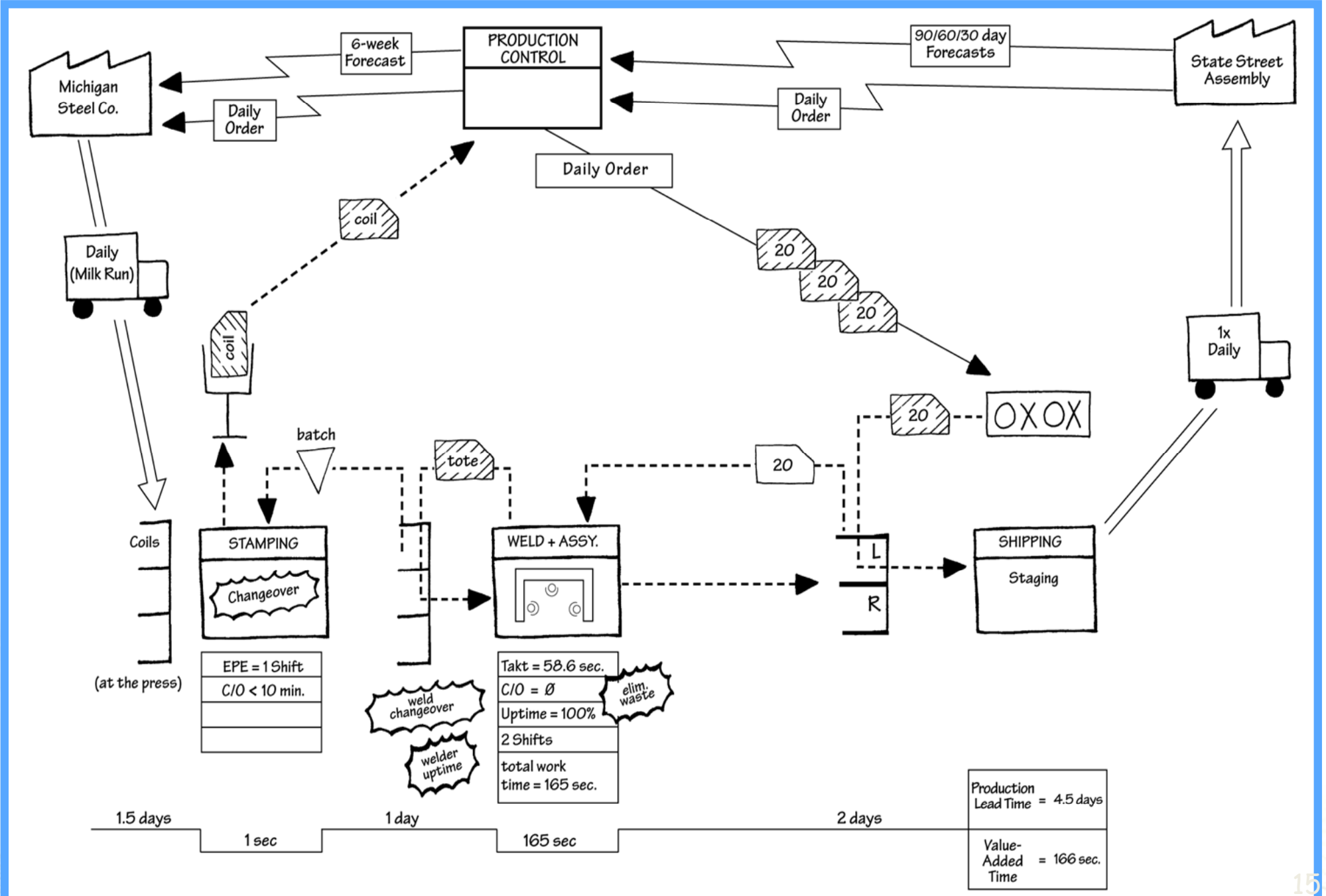
Ages of Lean: Tools

- 1990 in North America:
 - ✓ 5S
 - ✓ Jidoka/autonomation: poka-yoke, andon, line stops, etc.
 - ✓ Flow (through cellular layouts in process sequence)
 - ✓ Pull (with various types of signals – kanban, etc.)
 - ✓ 5-day (or 4-day or 3-day or...) kaizen
 - ✓ Value stream maps!
- Aimed overwhelmingly at reducing waste/cost.

Current-State Value Stream



Future-State Value Stream



State of Lean Today

A lot of tools. (A3 is the next!)

A lot of sawing and hammering, mostly aimed at waste reduction.

Limited progress in creating sustainable lean enterprises.

What has been left out?

- **Lean management.**
- **Lean leadership** needed to introduce a lean transformation, then sustain and steadily improve the new lean enterprise.

Lean Tools to Lean Management

To Progress Toward Lean Management

Every organization must address:

- **Purpose**
- **Process**
- **People**
- Defining the **purpose** & specifying the **process** for achieving the purpose by aligning the **people** touching the process is the central task of **lean management.**

Most Organizations Struggle

- **Purpose** is not clearly defined in terms of solving the customer's problems or addressing the business need.
- **Processes** creating value to address the purpose are not clearly specified and visible to everyone.
- **People**
 - ✓ Focus on the point they manage (often driven by point metrics) rather than optimizing the whole value stream.
 - ✓ Lack technical competence and a scientific method for improvement – A3 incorporating Plan Do Check Act (PDCA) – in order to “manage by science.”

Lean Management: Purpose

- Determine customer purpose.

Hint: In today's world many customers want to solve a problem rather than obtain isolated goods and services.

- Address purpose by identifying product-family value streams for specific customers.
- Determine the business problem, the “gap” between need and current performance.
- ✓ Product-family value-stream focus makes it easier to do both.

What's a Process?

- A series of steps that must be conducted properly in the proper sequence at the proper time to create value for some customer.
- All value is the result of some process; an enterprise is the sum of its processes.
- Some processes are primary because they touch customers:
 - ✓ Concept to launch, order to delivery, delivery through the product life cycle.
- Many more processes are supportive of the primary processes:
 - ✓ Hiring, training, payables, audits, planning, etc.
(Note that improving processes is a support process!)

What's a Lean Process?

- Value is correctly specified so the organization is trying to provide what the customer actually wants.

Note: If value is incorrectly specified the leanness of the process won't matter! Doing the wrong thing a better way is an exercise in futility.

What's a Lean Process?

- Every step is:
 - ✓ Valuable – as judged by the customer; the opposite of waste/muda (Henry Ford and Taiichi Ohno).
 - ✓ Capable – producing a good result every time (6 Sigma).
 - ✓ Available – ready whenever needed (Total Productive Maintenance).

(Note: Capability x availability = stability. Without basic stability everything else is difficult or impossible.)
 - ✓ Adequate – just enough capacity (Theory of Constraints and TPS).
 - ✓ Flexible – able to switch quickly at low cost from one product to the next to avoid batches (TPS).

What's a Lean Process?

- The steps are linked and coordinated by:
 - ✓ Flow – through placing the steps adjacent, in process sequence (Henry Ford and TPS).
 - ✓ Pull – through some type of authorization from each down stream step for the next upstream step to take some action (TPS).
 - ✓ Leveling – through heijunka from some pacemaker point in the process (TPS).

What's a Lean Process?

- Muda, mura, and muri are eliminated!
- ✓ **Muda** = any activity that consumes resources (including time) but creates no value for a customer.
- ✓ **Mura** = variation in the operation of a process not caused by the end customer.
- ✓ **Muri** = overburden on equipment, facilities, and people caused by mura and muda.

(Note that muda, mura, and muri cause each other!)

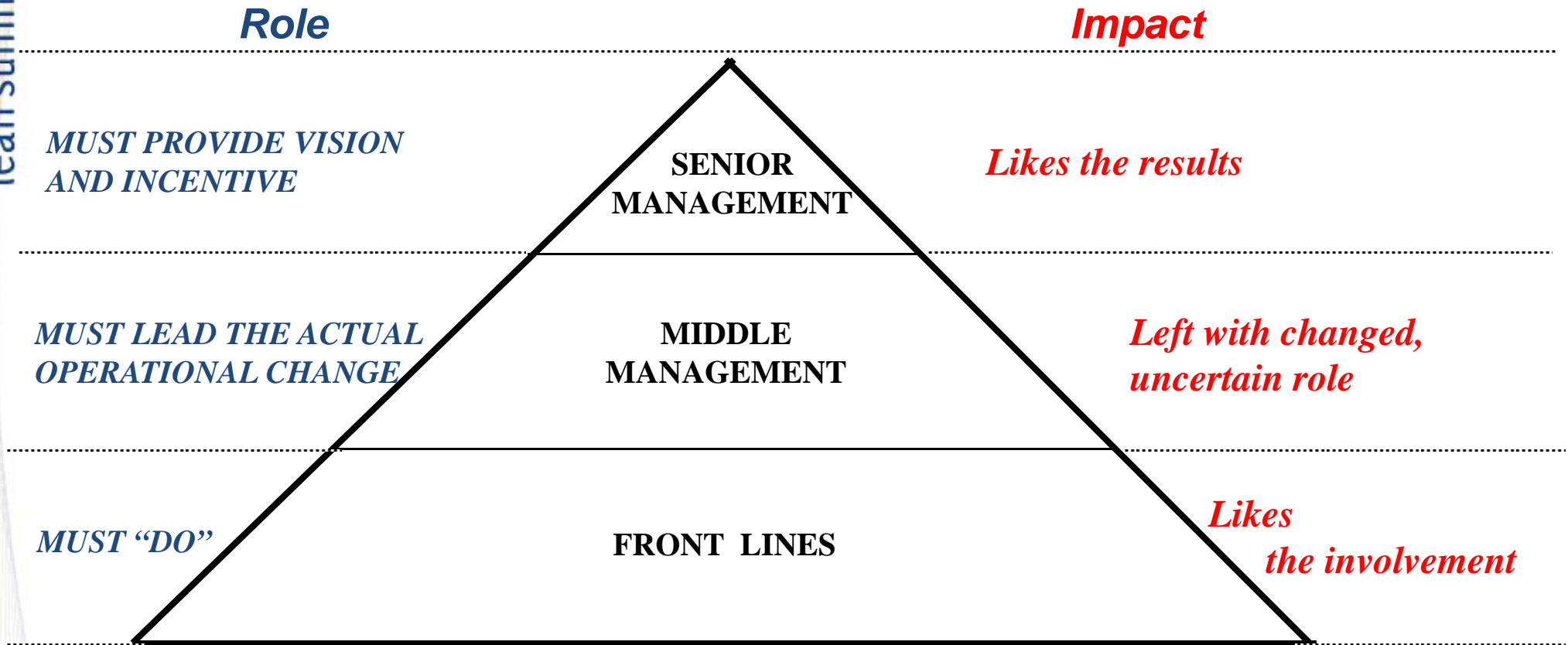
Lean Management: Process

- Address the process problem by making someone **responsible** for each value stream to:
 - ✓ Make the current state of the entire process clear to everyone, including the “purpose gap”.
 - ✓ Propose a better future state & take responsibility for implementing it.
 - ✓ Continuously address emerging problems, as close to the problem as possible.
 - ✓ Collaborate to standardize best practices across the organization. (Yokoten.)

Lean Management: People

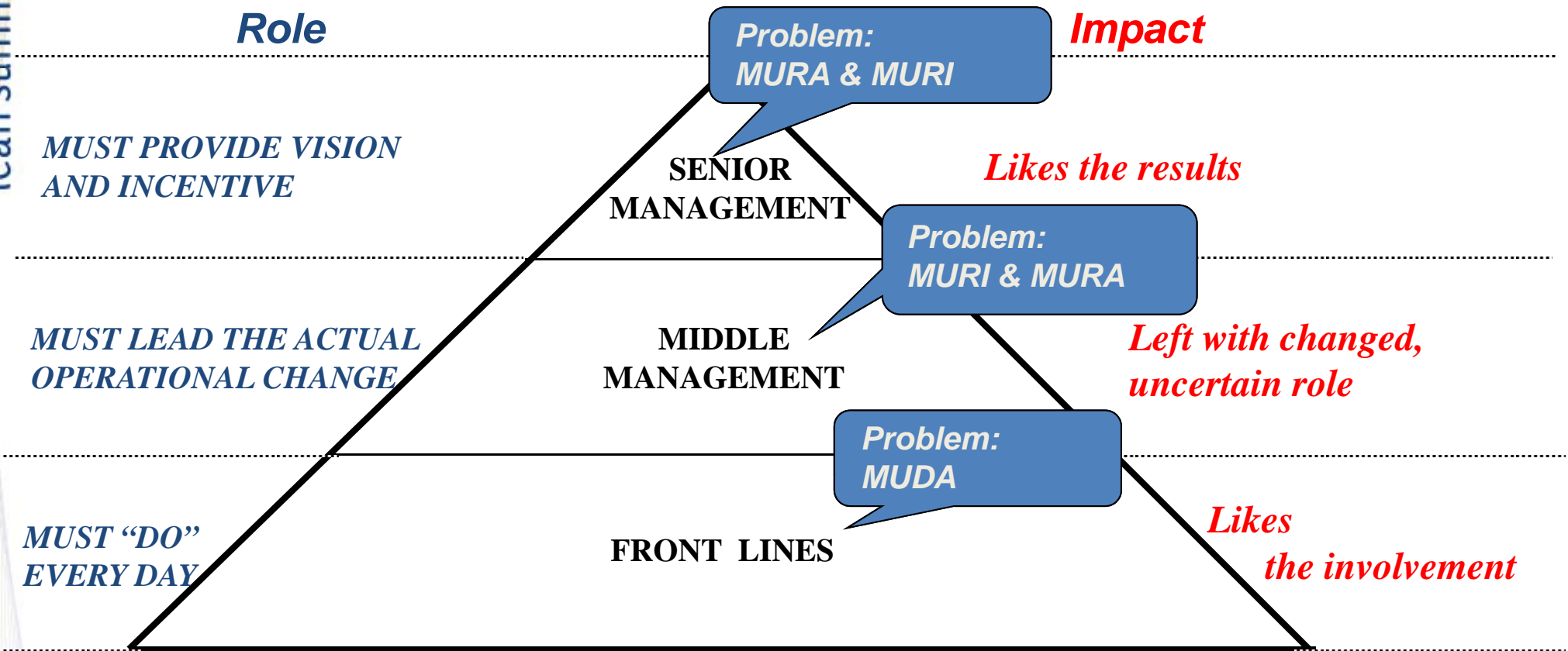
- Engage people at every level:
- ✓ Teach them to see the value stream.
- ✓ Give them deep technical knowledge and profound knowledge of process.
- ✓ Push responsibility for value stream management and improvement to lowest practical level of line management.
- ✓ Introduce metrics which encourage horizontal thinking with rapid feedback to make the abnormal visible.
- ✓ Create frequent problem solving loops between managers and subordinates.
- ✓ Via policy deployment, A3 analysis, and standardized work with kaizen.

Impact and Role of Lean at Different Levels



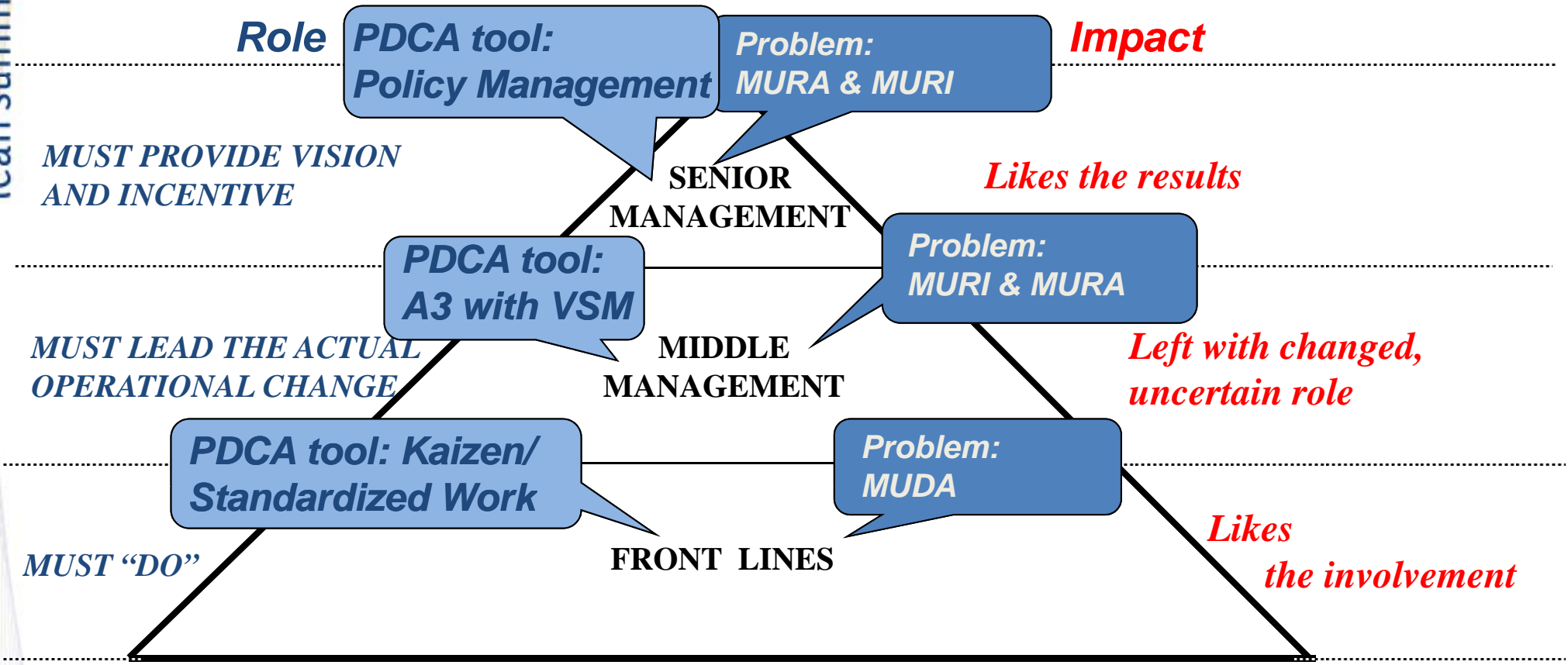
A Challenge at the Mid-management and First Line Supervisory Level

Levels of Lean Management



Senior levels must create stability and provide resources

Levels of Lean Leadership



Middle management role hardest to understand & change?

APEX TUBE COMPANY – Continuous Flow Project

Truck Fuel-Line Pacemaker Cell

1) Background/Business Case

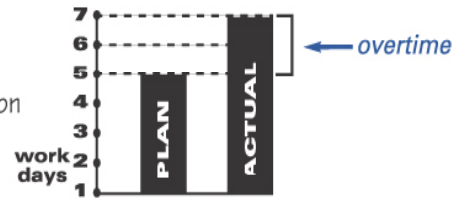
Be sure to link your plan to business objectives

Product – S/L/A Fuel Lines

Location – Anytown

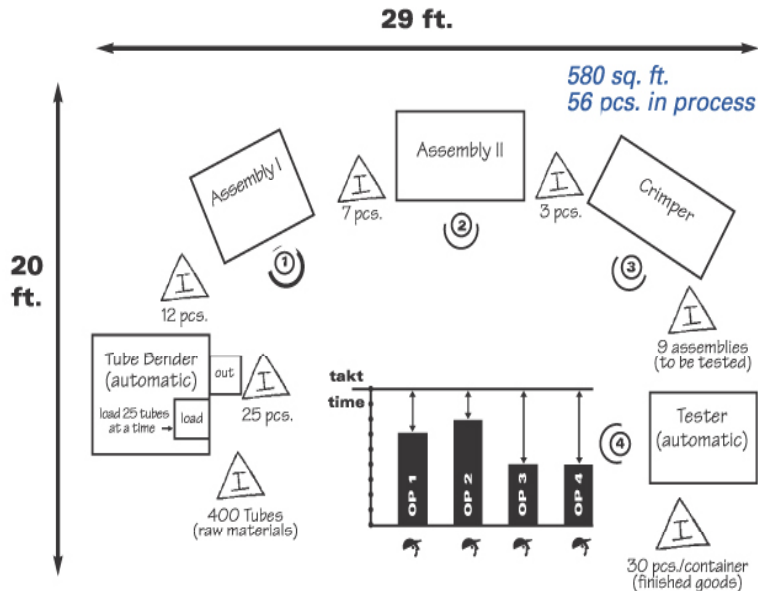
Needs:

- Customer requires 5% cost reduction
- Improve productivity

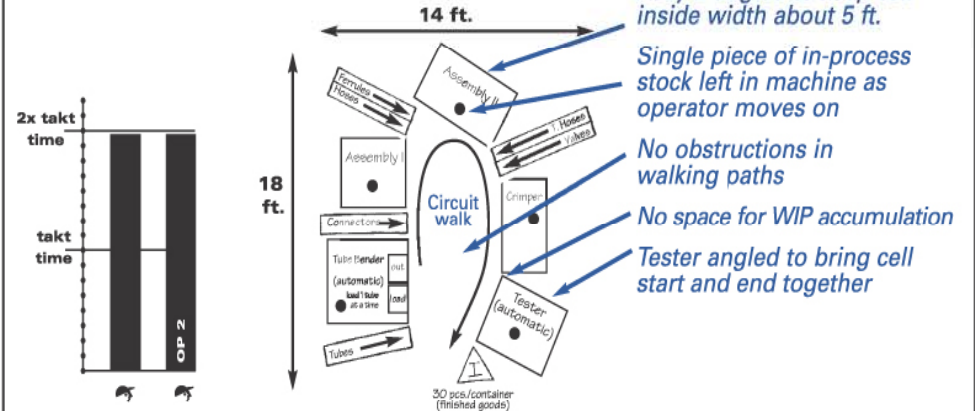


2) Initial condition

- No continuous material flow
- No people flow (operators stay at one machine)
- Unstable output
- Too much overtime
- Not working to takt time
- Too many operators for demand rate



3) Target Condition



4) Implementation

#	Task	Metric	Responsible person	Target date	Timeline				Review	Review
					March '04	April '04	May '04	June		
1	Introduction Training				○	△				○
2	Mock Up/Trial				○	△				○
3	Add Auto Eject				○	◇	△			△
4	Reconfigure Cell				○	△				○
5	Std. Work Training				○	△				○
6	Train Material Handlers				○	△				△
7	Cell Debugging				○	◇	?			
8	Finished-Goods Supermarket				○	△				
9	Production Kanban				○	△				
10	Frequent Withdrawal					○	△			
11	Helijunka Box									○

○ Proposed Start △ Proposed Completion ○ On Target × Trouble
 ● Actual Start ▲ Actual Completion △ Behind Target
 (Planning/Tracking) ◇ Review (Evaluation)

5) Indicators

	Pcs. per Hour	WIP	Space	Cost per Unit
Current				
Goal				

Be sure to include goals so level of success can be evaluated.

Lean Management in Summary

- **Purpose** – Help customers solve problems by correctly specifying value so the enterprise can prosper.
- **Process** – Through lean processes as simple and visible as possible.
- **People** – By engaging deeply knowledgeable people in repetitive **problem solving** and **standardization**.

But...how do organizations get there?

The role of **lean leadership**.