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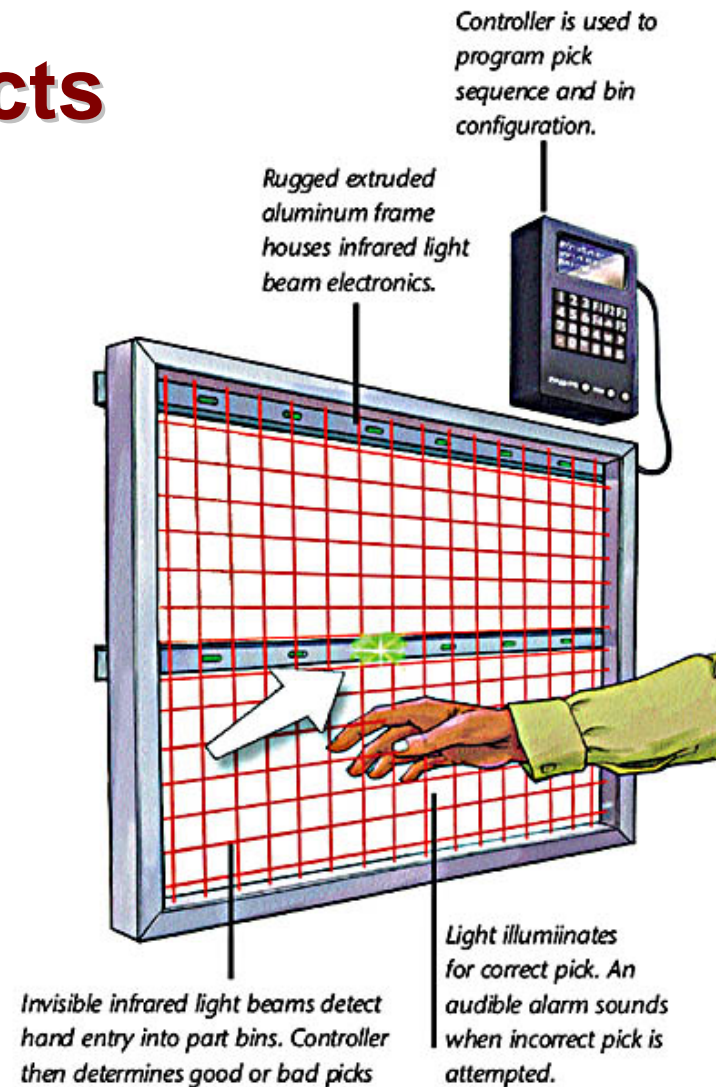
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Managing the Change Process in Lean Manufacturing

November 8th, 2006

Professor Gerald I. Susman, Ph.D.

Director of the Center for the Management of Technological and Organizational Change, Penn State University



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Three Implementation Challenges

- Providing strong management leadership
- Implementing lean practices and processes enterprise-wide
- Managing structural and cultural change

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Keys to Successful Implementation

- Lean is a philosophy and management system.
- Lean is a process — not a program or project.
- Continuous improvement means that lean is never really done.
- Every lean tool has a philosophical rationale.
- Lean requires change at every level of the enterprise.

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Essential Lean Principles

- Value starts with the customer (pull, flow, perfection).
- Waste is anything that does not add value.
- Standardization facilitates problem recognition.
- Links between workers, processes, and outcomes should be short, simple, and visible.
- People are respected (faith in their ability to learn, no lay-offs).

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Examples of Waste

- Overproduction
- Rework and scrap
- Inventory
- Waiting
- Transporting
- Unnecessary motion
- Ineffective processing
- Ineffective communication

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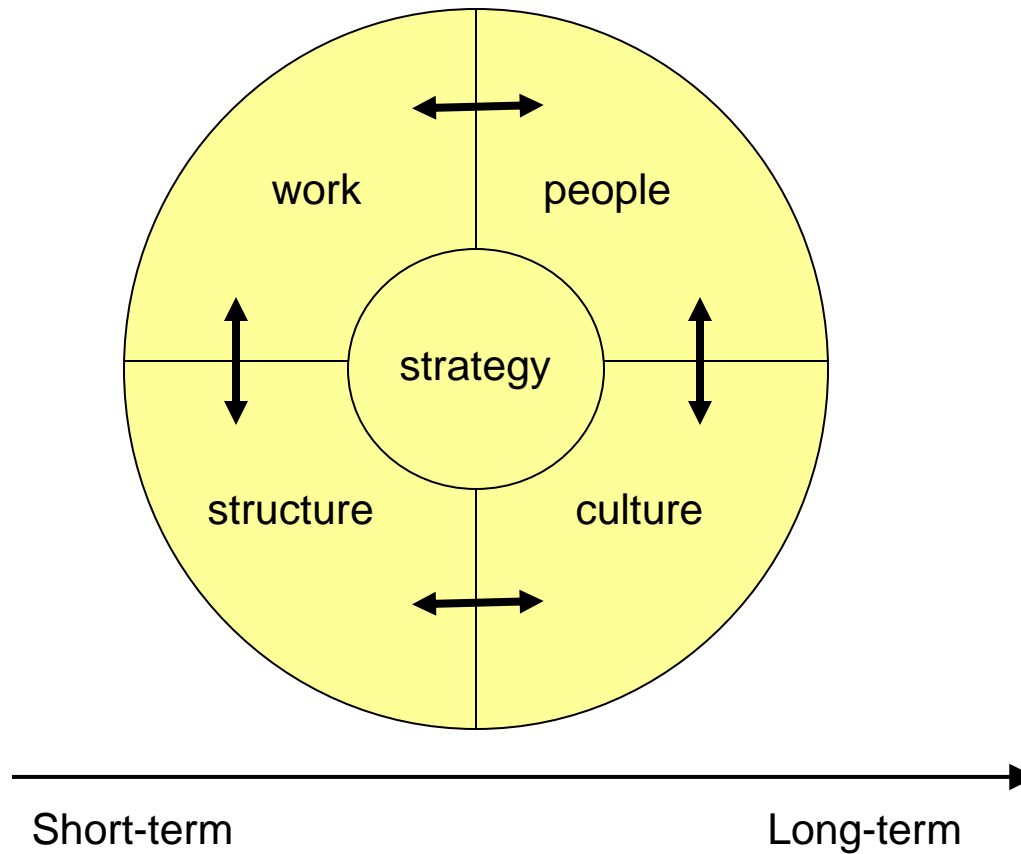
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Implementation Takes Strong Leadership

- Top management must communicate the lean philosophy frequently at multiple sites and through multiple media. They must “walk the talk”.
- A steering committee (diverse and representative) must translate philosophy into a realistic vision. May need to read and visit plants in order to develop a vision.
- A lean champion must guide implementation on a daily basis.
- Supervisors and technical staff become coaches and problem-solvers.



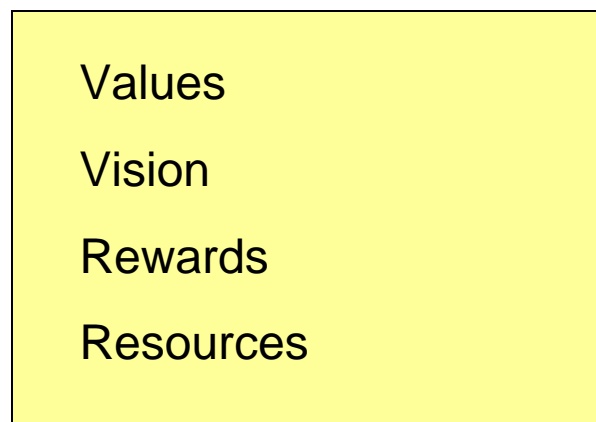
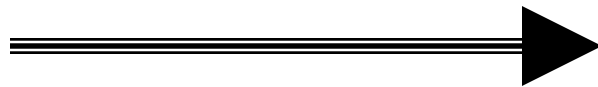
Change Targets



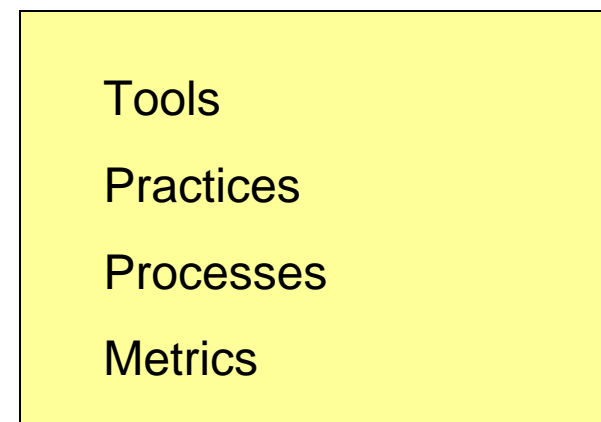
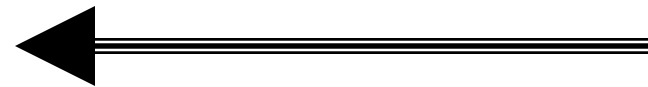


Implementation is Multi-Level

Leadership



Implementation



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Change in Strategy

- Offer customers enhanced responsiveness and customization in addition to lower cost.

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Where to Start?

- Final assembly
- Self-contained work unit
- Not the best, not the worst
- Established product design
- Stable product demand
- Open-minded and enthusiastic workers and supervisors

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Education and Training

- Train managers and supervisors first so they can act as role models.
- Train workers in team building and communication skills.
- Problem-solving starts with observation. Ask workers to identify defects.
- Learning is by doing. 5-why's. Root cause analysis.
- Perceptual IQ is as important as conceptual IQ (aided by standardization, simplification, and easily recognized signals).

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Change in People and Work

- Work is collaborative — no heroes or lone rangers
- Problem-solving occurs at all levels
- Select workers on ability to diagnose, tolerate ambiguity **and** communicate problems
- Introduce a pay-for-knowledge system
- Design jobs with open boundaries
- Offer open-ended psychological contract

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Change in Structure

- Multi-skilled work teams
- Flatter structure (by assigning technical staff to teams)
- New roles and career paths for functions



Changed Roles For Functions

Product Engineering	Process Engineering	Quality Assurance	Purchasing	Human Resources	Finance & Accounting	Sales & Marketing
DFM Mistake proofing Parts reduction Reasonable tolerances	Eliminate bottlenecks Eliminate batch & queue Limited use of MRP Eliminate monuments	Eliminate inspecting Become mentors Root-cause problem-solvers Stop process when defects are identified	Reduce number of suppliers Commit to longer terms Certify suppliers Synchronize delivery schedules	Training New incentives Work force reduction by attrition New selection criteria	Throughput cost Arrange data by cells Non-financial measures Financial measures WIP?	Deliver product in smaller, more frequent lots Voice of the customer in new product designs

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Change in Culture

- Management must promote values that are consistent with the company's new vision and strategy, and act in accordance with them. This encourages employee behavior that is consistent with the vision and strategy.
- If management's behavior is inconsistent with the values it promotes, then a culture of cynicism will develop that may encourage counterproductive employee behavior.
- Promotion includes speeches, emails, and memos, but also includes daily words and actions. Managers must use every possible channel to communicate with employees while making sure that their words and actions are consistent with the vision.

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Change in Culture (continued)

- Accounting should not be a “command and control” tool.
- Information should be abundant (not “need to know” basis), timely and relevant.
- Don’t seek blame, but use “mistakes” to make improvements.
- Suggestions should be solicited in multiple settings and taken seriously. Rewards and recognition must be given for suggestions that enhance performance.
- No silos. Cross-functionally train employees to expand their knowledge so they understand the “big picture”.
- Overcome mass-production mindset (e.g., machine utilization)
- Conduct periodic “value audits”.

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Process Measures

- Non-financial metrics (inventory, first-time yield, operational availability)
- Frequent, simple, and quick feedback (graphs, visuals)
- Team-based rewards
- Weekly review meetings
- Goals should stretch capabilities, but be realistic and allow for adequate resources
- Focus on the long-term, but reward on short-term progress

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Outcome Measures

- Financial (revenues, gross margins, cost of goods sold)
- New products introduced (percent contributed to revenue)
- Customer satisfaction (OTD, customization, responsiveness)
- Milestone celebration

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Extend Lean Beyond the Firm's Boundaries

- Customers: (avoid hedging and hoarding by offering them consistent prices and reliability)
- Suppliers: (fewer, long-term commitment, sole source, greater investment in supplier training, put customer's engineers in the suppliers' organization)

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Obstacles

- Culture of blaming, status differences, silos
- Workers won't stop process when defects are identified
- Workers won't produce only what's required
- Management is unwilling to dedicate machines to cells
- Inadequate investment in cross-training (on-the-job and classroom)
- Uneducated or uncommitted suppliers
- Change of ownership
- Uninterested top management
- Overly ambitious goals
- No slack (people and time) provided for learning
- Pioneers rewarded more than late adopters, "star-envy" of pioneers

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Questions

