An Emerging Theory for Lean Enterprise Change

George Roth
Massachusetts Institute of Technology
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Lean Enterprise Transformation Trajectory

Lean Enterprises

Lean Company

Lean Factory

Lean Applied to Enabling Processes
- HR
- IT, etc.

Successes Through Interaction Between Functions

Lean Enterprise Model

Toyota Production System

Lean NOW! & EVSMA

LAI Book

Lean Enterprise

Transition from Waste Minimization to Value Creation

Success Through Integrated Industry- Government projects

Integration of All Stakeholders
- Industry
- Government
- Suppliers
- Employees

LEANT RAN SELF ASSESSMENT TOOL (LESAT)

Transition to Lean Roadmaps

Success Through Enterprise Integration of All Stakeholders

• Industry
• Government
• Suppliers
• Employees

Maturity of concepts, tools, integration and interoperability

Three LAI Knowledge Areas

Enterprise Change
- Strategies for accelerating enterprise-level change
- Success factors in achieving sustainable enterprise transformation

Product Lifecycle
- Spiral product development in a system-of-systems environment
- Revitalizing systems engineering capabilities

Enterprise Architecting
- New concepts & methods for designing future lean enterprises
- Principles & practices for evolving adaptive lean enterprises
Enterprise Change Research

• What do we know about organizations, enterprises, improvement, and change?
  • Organizational theory to lean enterprises
  • What kind(s) of change?
    • Innovative organizational forms & complementarity
  • What kind of change process?
  • Limitations of planned organizational change for enterprises

• What have we been doing?
  • Enterprise change research directions
  • Field work and case studies

• Where are we headed?
  • Current plans
  • Future directions
What do we know about organizations?

Input

CEO
Executive Board

Conversion

Output

Sales  Engineering  Manufacturing  Purchasing  Research and Development

Environment $ $$ about organizations?
## Managing Organizational Effectiveness

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| External resource approach | Evaluates the organization’s ability to secure, manage, and control scarce and valued skills and resources | • Lower costs of inputs  
• Obtain high-quality inputs of raw materials and employees  
• Increase market share  
• Increase stock price  
• Gain support of stakeholders such as government or environmentalists |
| Internal systems approach  | Evaluates the organization’s ability to be innovative and function quickly and responsively | • Cut decision-making time  
• Increase rate of product innovation  
• Increase coordination and motivation of employees  
• Reduce conflict  
• Reduce time to market |
| Technical approach         | Evaluates the organization’s ability to convert skills and resources into goods and services efficiently | • Increase product quality  
• Reduce number of defects  
• Reduce production costs  
• Improve customer service  
• Reduce delivery time to customer |
Organizational Culture

... is the set of shared assumptions, values and norms that control organizational member’s interactions with each other and with people outside the organization.

Organizational Culture Model

from Schein (1992) Organizational Culture and Leadership

- **Artifacts**
  - stories people tell,
  - visible organizational behavior, processes, and structure
    (hard to decipher)

- **Values**
  - strategies, goals, philosophies
    (espoused beliefs and justifications)

- **Basic Assumptions**
  - unconscious beliefs, habits, perceptions, thoughts, and feelings
    (ultimate source of values and actions)
What is the “lean” organizational culture?

TOYOTA

Goal: Highest Quality, Lowest Cost, Shortest Lead Time

Just-in-Time
- Continuous Flow
- Takt Time
- Pull System

Jidoka
- Stop and notify of abnormalities
- Separate man’s work & machine’s work

Heijunka

Standardized Work

Kaizen

Decoding the DNA of the Toyota Production System

By Steven Spear and H. Kent Bowen
**“Lean” cultural assumptions:**

**4 Rules at Toyota**

**Rule 1:** All work shall be highly specified as to content, sequence, timing and outcome.

**Rule 2:** Every customer-supplier connection must be direct, and there must be an unambiguous yes-or-no way to send requests and receive responses.

**Rule 3:** The pathway for every product and service must be simple and direct.

**Rule 4:** Any improvement must be made in accordance with the scientific method, under the guidance of a teacher, at the lowest possible level in the organization.

Source: “Decoding the DNA of the Toyota Production System” Spear & Bowen, HBR 99
"occupational communities" generate sub cultures within organizations

Organizational Culture Model
from Schein, 1996 “Three cultures of Management: the key to organizational learning” Sloan Management Review

Artifacts
- stories people tell
- visible organizational behavior, processes and structure

Values
- strategies, goals, philosophies (espoused beliefs and justifications)

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Operator sub-culture
Engineering sub-culture
Executive sub-culture
The learning problems can be directly related to the lack of alignment between three cultures, two of which are based on occupational communities

1) the culture of engineering,
2) the culture of executives and CEO's, and
3) the culture of operators--the shared assumptions that arise in the "line units" of a given organization as it attempts to operate efficiently and safely.

These cultures create communication problems associated with crossing organizational sub-culture boundaries

Example: For executives: decisions have to be put in a form that lower levels can understand…
          often resulting in translations that actually distort and sometimes subvert what higher levels wanted

Organizations will not learn effectively until they recognize and confront the implications of different sub cultures
Managing Organizational Effectiveness

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| **Executive culture**           |                                                                             |                                       |
| **Internal systems approach**   | Evaluates the organization's ability to be innovative and function quickly and responsively | • Cut decision-making time  
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| **Operator culture**            |                                                                             |                                       |
| **Technical approach**          | Evaluates the organization's ability to convert skills and resources into goods and services efficiently | • Increase product quality  
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• Reduce delivery time to customer |
| **Engineering culture**         |                                                                             |                                       |
What kind(s) of change?

- New organizational forms
- Changing boundaries, processes & structures
- Links to performance
New Organizational Forms: 4 themes

- Greater Permeability of Organization Boundaries, The Development of Networks, Webs, Co-operative Relations, Alliances and Clusters
- Compressing the Structural and Cultural Features of Hierarchy through Delayering, Downsizing, and Building More Co-operative Forms of Managerial Style
- Associated Drives to Develop More Creative, Agile, Learning Forms (competition As An Innovation Contest)
- The Linguistic Turn From Organization to Organizing

* Based on work by Andrew Pettigrew, University of Bath
Key References

Charts used in briefing were those of Prof. Andrew Pettigrew; similar materials may be found in these references:


The Innovating Organization (Eds) Andrew Pettigrew and Evelyn Fenton, London: Sage, 2000

Innovating Forms and change in US, European and Japanese companies

Using data generated by eight current international case studies, the book provides fresh insights into the network organization, and suggests new methodologies for organizational research. It includes a systematic, empirical study of the change in forms from traditional multi-divisional hierarchies to flatter, less rigid networks. Coopers & Lybrand, BP, Unilever, Rabobank and Saab are amongst the companies studied.

* Based on work by Andrew Pettigrew, University of Bath
Systemic change:
Europe, Japan and US, 1992-1997

Using a comprehensive data sets of the INNFORM programme of research (775 firms), this book examines the development of innovative forms of organizing and company performance in organizations across Europe, Japan and the United States.

Three themes summarize the books findings:

1. organizing and strategizing;
2. complementarities, change and performance; and
3. the management of dualities in the modern corporation.

* Based on work by Andrew Pettigrew, University of Bath
What kind of change process?

- Planned change
- Enterprise limitations
- Theories E & O change
- Capability-based change
What kind of change process?

Planned Change Model

- Why Change?
  - Determining the need for change
  - Determining the degree of choice about whether to change

- Defining the desired future state
- Describing the present state
- Getting from here to there: Assessing the present in terms of the future to determine the work to be done

Managing transition
- Unfreezing
- Modeling
- Refreezing

Nature of demands on system
Source of demands for change

Demand/response system
Core Mission
Scenario writing
Transition management structures analysis
Devising an activity plan

From Beckhard & Harris, Organizational Transitions, Addison-Wesley, 1987
Effective Change involves eight sequential steps:

1. Establishing a Sense of Urgency
2. Creating a Guiding Coalition
3. Developing a Vision & Strategy
4. Communicating the Change Vision
5. Empowering Broad-based Action
6. Generating Short-term Wins
7. Consolidating Gains & Producing More Change
8. Anchoring New Approaches in Culture

LEADING CHANGE is not MANAGING CHANGE
Limitations of Planned Change

Multi organization enterprise:

- New organizational forms correlate with high performance

- Enterprises are:
  - Poly-centric
  - Loosely organized
  - Loosely coupled
Challenges of Enterprise Change

- Organizations are:
  - Hierarchical
  - Over organized
  - Tightly coupled

- Enterprises are:
  - Poly-centric
  - Loosely organized
  - Loosely coupled

- Different assumptions about change and context
- Do not assume that we can bootstrap past knowledge
- Need a new theory of change that is based on enterprises

web.mit.edu/lean
Enterprise Change Theory

Developing a theory based on:

- Identification of “system,” its boundaries, and [inter]dependencies

- Unlearning of current knowledge and practice
  - Developing learning & performance within and across organizations
  - Inter-Structure: facilitating learning and knowledge transfer across organizations?

- Directiveness: Providing **direction**, creating **capabilities** and ensuring **alignment** (can’t “organize” a mess), need to **strategize**, **architect**, and **orchestrate**
  - Looking across organizational boundaries and along value stream for improvement opportunities
What kind of change process?


HBS Research Grant: conference in summer of 1998: 50 academics and 25 consultants and 6 CEOs, debating the different perspectives on change.

Two dramatically different assumptions about the purpose for, and means of, organizational change emerged:

- **Theory E** – based on Economic Value
- **Theory O** – based on Organizational Capability

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<tr>
<th>Dimensions of Change</th>
<th>Theory E</th>
<th>Theory O</th>
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<tbody>
<tr>
<td>Goals</td>
<td>Maximize value</td>
<td>Develop capabilities</td>
</tr>
<tr>
<td>Leadership</td>
<td>Top down</td>
<td>Bottom up</td>
</tr>
<tr>
<td>Focus</td>
<td>Structure and systems</td>
<td>Corporate culture</td>
</tr>
<tr>
<td>Process</td>
<td>Programmatic</td>
<td>Emergent</td>
</tr>
<tr>
<td>Reward system</td>
<td>Financial incentives lead</td>
<td>Commitment leads and incentives lag</td>
</tr>
<tr>
<td>Use of consultants</td>
<td>Expert consultants analyze problems and shape solutions</td>
<td>Consultants support process to shape own solutions</td>
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What kind of change process?

Theories E and O approach the problem of organizational change from two different, but equally legitimate perspectives....

**neither achieves all the objectives of management in most cases!**

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<tr>
<td>Goals</td>
<td>Embrace paradox between value and organizational capability</td>
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<tr>
<td>Leadership</td>
<td>Set direction from top and engage people from below</td>
</tr>
<tr>
<td>Focus</td>
<td>Focus simultaneously on hard and soft</td>
</tr>
<tr>
<td>Process</td>
<td><em>Plan for spontaneity</em></td>
</tr>
<tr>
<td>Reward system</td>
<td>Incentives reinforce but do not drive change</td>
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<td>Use of consultants</td>
<td>Consultants are expert resources who empower employees</td>
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A theory of effective organizational change (for the long term)

...high-leverage ways to shift direction at a large scale...
Profound Change

“... is change that combines ‘inner’ shifts in people’s values, aspirations and behaviors with ‘outer’ shifts in processes, strategies, practices and systems... The organization doesn’t just do something new; it builds its capacity for doing things in a new way – indeed, it builds capacity for ongoing change.”

-- The Dance of Change, p. 15
Premise 1: Change starts small and grows organically

- Sustained change accelerates as nature does, constrained by the resources available to it.
- Imposed “Roll-outs” don’t work.
- “Every movement is being inhibited as it occurs” - Humberto Maturana
Premise 2: Change is only sustainable if it involves learning

- Knowledge workers don’t just “do;” they also think.
- It takes less time, in the long run, to involve people in strategy & purpose.
- Sustained change depends upon commitment.
- You can’t force commitment; you can only inspire it.
Premise 3: Pilot groups are the incubators for change

- The size of a pilot group: from three people to 500.
- Senior management teams are also pilot groups.
- One common feature: A predisposition toward pragmatic curiosity
Premise 4: Successful change requires three forms of leadership

- Executive leaders - defining the organizational environment, offering permission, protection, evaluation, and context.
- Local line leaders - developing changes in ways that produce results, galvanizing activity around a project, and managing accountability.
- Internal networkers - building community and diffusing experience, making sure that the line leaders do not act alone.
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Network leadership – crossing occupational communities, ensuring alignment without hierarchical authority

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Growth Processes of Profound Change

*Reinforcing loops*

- Personal results
- Networks of committed people
- Business results

![Diagram showing reinforcing loops with nodes labeled R1, R2, R3, Business Results, Personal Results, Networking and Diffusion, Credibility, Enthusiasm & Willingness to Commit, New Business Practices, Learning Capabilities, Investment in Change Initiatives, People Involved, Delay markers.]
The growth we expect (and prepare for)

Patterns of Behavior in Limits to Growth
Sustaining change requires understanding the reinforcing growth processes and what is needed to catalyze them, and addressing the limits that keep change from occurring.
Frameworks for Lean Transformation: TTL

Programmatic Change

- Entry/Re-entry Cycle
- Adopt Lean Paradigm
- Focus on the Value Stream
- Long Term Cycle
- Initial Lean Vision
- Detailed Lean Vision
- Develop Lean Structure & Behavior
- Short Term Cycle
- Create & Refine Transformation Plan
- Lean Transformation Framework
- Enterprise Level Transformation Plan
- Implement Lean Initiatives
- Outcomes on Enterprise Metrics
- Environmental Corrective Action Indicators
- Detailed Corrective Action Indicators
- Focus on Continuous Improvement
- Decision to Pursue Enterprise Transformation
- Enterprise Strategic Planning
- Challenge of understanding & managing flow-down and feedback

Emergent Change

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Lean Enterprise Change

What does it take?

• Lean principles and tools
  • As artifacts of deeper cultural assumptions that enable a virtuous learning process within a “community of scientists”

• Leadership
  • Providing direction, enabling capabilities, modeling new ways, and ensuring alignment
  • Top-down (planned) with bottom-up (capability-enabled) change
  • Inter-generational and strong leadership continuity

• Complementary approach
  • Installing complete sets of practices

• Growth as the persuasive orientation
  • A positive vision for continual renewal

• Working across boundaries
  • Organizing across a network of organizations
What do we know about organizations, enterprises, improvement, and change?

- Organizational theory to lean enterprises
- What kind(s) of change?
  - Innovative organizational forms & complementarity
- What kind of change process?
- Limitations of planned organizational change for enterprises

What have we been doing?

- Enterprise change research directions
- Field work and case studies

Where are we headed?

- Current plans
- Future directions
Enterprise Change Research

Goal:
• better understand and guide the human, social and psychological elements of change in lean enterprise transformations

How?
• Case studies of lean enterprise change
• Working with LAI sponsors to implement lean tools and principles – how do they do it, what matters and how can we help?
• Using, testing, and developing the Transition to Lean Roadmap and other tools/frameworks to assess and guide enterprise change and transformation
Enterprise Change Research

Thrusts:
• Case studies
  • lean transformation efforts and best practices in government and industry

• Metrics
  • linking improvement initiatives, change and performance

• Across organizations
  • enabling infrastructure for developing knowledge and diffusing practice

Teams:
• Enterprise Change Research Team
  • Members: John Carroll, George Roth, Chet Labedz, Jennifer Hartwell, Jessica Cohen, Justin Hemann [Scott McKenzie & Alexis Stanke]

• Metrics Team
  • Members: Noel Nightingale, George Roth, Jayakanth Srinivasan, Vikram Mahidhar, Geoff Bentley

• Sustaining Lean Change Team (formerly Goal 5 team)
  • Co-chairs: Debbie True, Steve Sleigh, George Roth, Joel Cutcher-Gertchenfeld, [Gov’t TBD]
Current Projects

Current Thesis
- **US Air Force Logistics Centers: Lean Enterprise Transformation and Associated Capabilities** – Jessica Cohen, MS TPP, June 2005
- **Improving Complex Enterprises with System Models** – Justin Hemann, MS Aero/Astro, June 2005
- **Metrics and Performance Management System for Lean Enterprises** – Vikram Mahidhar, MS ESD, June 2005 (joint with Enterprise Architecture)

Case study references
- **Raytheon** – Enterprise Change and Paveway program
- **Warner Robins** – Enterprise Change, C-5, C-130, & PR
- **Rockwell Collins & others** – in planning
Future Directions

• **Transition to Lean Roadmap Update**
  - for cross-organizational enterprise transformation aligning strategic planning with organizational capability

• **Cooperative projects that bridge LAI research areas**

• **MIT Enterprise Change Graduate Seminar & Executive Development Curriculum**

• **Case study references**

• **Fieldbook for Enterprise Transformation**
  - Theory, framework, examples, and references