Lean Success Breakout Session A:
Industry-Government Infrastructure
Presented By
Ron Jobo ~ Ed Kraft ~ George Roth
Main Presentations:

- Lean Now in Turbine Engine Development / Sustainment Process
  - Ed Kraft
- Sustaining the Lean Movement in the Global Hawk SPO
  - Ronald Jobo

Short Presentation & Discussion Lead:

- Partnering for learning: Corporate-University Alliances
  - George Roth
Lean Success Breakout Session A: Industry-Government Infrastructure

Short presentation and discussion lead
Partnering for learning: Corporate-University Alliances
George Roth
MIT Sloan School / LAI
Partnering for learning: University-Corporate Alliances

What are they?
- Multi-year, multi-project agreements to work together in important strategic and research areas
- MIT: Amgen, Merck, Ford, NTT, Merrill Lynch, DuPont, Microsoft, Hewlett Packard
- 20% of MIT’s corporate research volume

How do they work?
- Top-level involvement from MIT and company
- Setting a strategic agenda
- Operational simplicity - letting organizations be creative in working with one another, small executive and operating committees
- Attaining value from multiple streams of activities
  - Research, relationships and advice from faculty, broader understanding of technical and research tends, education, hiring good students, standard setting, influence regulation and policy

What have we learned?
## MIT’s Corporate-University Alliances

<table>
<thead>
<tr>
<th>Year Started</th>
<th>Company</th>
<th>Size</th>
<th>Departments/Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>Amgen</td>
<td>30M in 10 years</td>
<td>Biology</td>
</tr>
<tr>
<td>1997</td>
<td>Merck</td>
<td>15M in 5 years</td>
<td>Biology</td>
</tr>
<tr>
<td>1997</td>
<td>Ford</td>
<td>20M in 5 years</td>
<td>All MIT – Engineering Product Development and Environmental Policy &amp; Science</td>
</tr>
<tr>
<td>1998</td>
<td>NTT</td>
<td>18M in 5 years</td>
<td>Artificial Intelligence &amp; Computer Science Laboratory</td>
</tr>
<tr>
<td>1999</td>
<td>Merrill Lynch</td>
<td>20M in 5 years</td>
<td>Sloan &amp; Engineering – Financial Engineering</td>
</tr>
<tr>
<td>1999</td>
<td>DuPont</td>
<td>35M in 5 years</td>
<td>Chemistry, Biology, Biomedical &amp; Materials engineering</td>
</tr>
<tr>
<td>1999</td>
<td>Microsoft</td>
<td>25M in 5 years</td>
<td>All MIT – Educational innovations</td>
</tr>
<tr>
<td>2000</td>
<td>Hewlett Packard</td>
<td>25M in 5 years</td>
<td>All MIT – digital libraries, software</td>
</tr>
</tbody>
</table>
Partnering for Learning: Alliance Sources of Value

**Corporation**

- Competitive advantage and higher profitability
- Shareholder value and new revenue
- Impact on current product or process
- Advantage in recruiting students
- Education, knowledge, and technology transfer (stimulating environment for technical people)
- Convening power of university on important social, economic, and policy issues
- Ability to give an idea publicity
- Priority in commercializing technical developments
- Information transfer
- Inexpensive research
- Association with prestigious institution, profession and individuals
- Sense of good stewardship and citizenship
- Philanthropy and donation of time and money

**University** (MIT)

- Breaking research, theory, and publications
- Academic journal article/peer reviewed publication
- Academic conference presentation
- Book or book chapter
- Industry or trade publication
- Faculty development
- Education opportunities for faculty & funding
- Education opportunities for students, funding, and employment (hands-on work with top executives)
- Education materials (real case studies)
- Information on research, business and engineering issues and problems
- Access - time spent with sponsor, meeting industry managers and technical people and understanding industry issues
- Money and funding, prestige of link with successful industrial companies

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**Increasing positive value**

- Breakthrough research, theory and publications
- Academic journal article/peer reviewed publication
- Academic conference presentation
- Book or book chapter
- Industry or trade publication
- Faculty development
- Education opportunities for faculty & funding
- Education opportunities for students, funding, and employment (hands-on work with top executives)
- Education materials (real case studies)
- Information on research, business and engineering issues and problems
- Access - time spent with sponsor, meeting industry managers and technical people and understanding industry issues
- Money and funding, prestige of link with successful industrial companies

**Increasing negative value**

- Produce good research that is not implemented
- Raise expectations of employees and students so that they leave
- Educate and inform competitors of corporation’s know-how
- Implement ideas at competitors
- Speeding time spent that doesn’t lead to publications or education
- High % or time spent reacting to sponsors information and meeting requests
- Good research that is not implemented because corporation constrains it
## Partnering for learning: Alliance Benefits at multiple levels

<table>
<thead>
<tr>
<th>Level of benefit:</th>
<th>COMPANY SPECIFIC</th>
<th>UNIVERSITY SPECIFIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Societal:</strong></td>
<td>set industry standards</td>
<td>job opportunities</td>
</tr>
<tr>
<td>Industry, academia and government levels</td>
<td>model for global environmental stewardship</td>
<td>new research</td>
</tr>
<tr>
<td></td>
<td>educate future leaders</td>
<td>industry relationships</td>
</tr>
<tr>
<td></td>
<td>transfer knowledge</td>
<td>teachable knowledge</td>
</tr>
<tr>
<td></td>
<td>influence policy</td>
<td>funding, access and support</td>
</tr>
<tr>
<td></td>
<td>share strategies</td>
<td>understanding of realworld problems</td>
</tr>
<tr>
<td><strong>Organization al:</strong></td>
<td>share strategies</td>
<td>understanding of complex system design principles</td>
</tr>
<tr>
<td>Alliance, strategic company and institute levels</td>
<td>shape each other’s futures</td>
<td>greater credibility</td>
</tr>
<tr>
<td></td>
<td>co-location</td>
<td></td>
</tr>
<tr>
<td></td>
<td>understanding of complex system design principles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>greater credibility</td>
<td></td>
</tr>
<tr>
<td><strong>Local/individual:</strong></td>
<td>source of project support</td>
<td>funding</td>
</tr>
<tr>
<td>Individuals:</td>
<td>insight and learning</td>
<td>access and data</td>
</tr>
<tr>
<td>Executive, manager, faculty, staff &amp; student levels</td>
<td>advice</td>
<td>feedback</td>
</tr>
<tr>
<td></td>
<td>consulting</td>
<td>impact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>consulting</td>
</tr>
</tbody>
</table>
Partnering for learning: University-Corporate Alliances

MIT Partnership study “best practices”

- Adherence to standard MIT policies
- Transparent governance structure that encourages faculty proposals
- Match of interests of the sponsoring company and faculty
- Realistic match of expectations with deliverables
- Leadership at executive (strategic), line (operational) and network (knowledge) roles
  - Dedicated company staff as well as significant participation by senior management
  - Committed MIT faculty and staff
- Fellowship support for graduate students and links to post doc, graduate, and undergraduate students for internships and employment
Partnering for learning: University-Corporate Alliances

What questions and focus does a partnering-for-learning focus bring to Industry-Government Infrastructure for Lean Success?

- What mechanisms are in place to facilitate learning and change?
  - Improvement in performance is main goal
  - Developing and retaining capability for continuous improvement is secondary goal

- How are different constituencies or stakeholders involved?
  - Program team, suppliers and customers
  - Management, engineering, production, acquisition, sustainment, accounting and finance
  - Executive, line and network leadership roles
Common features of lean success

**Lean Now Processes**

- Common “best practices” for lean
- Industry SMEs partnering with government
- “Spotlight” on improvement efforts
- Fresh and enthusiastic lean learning team – new tools and approaches applied “just in time”
- Broad and appropriate engagement of stakeholders in lean learning and subsequent implementation

**Content**

- Multi-year technical programs involving multiple functional and organizational stakeholders – *enterprise challenges*

Conditions and process include technical and organizational complexity – require integration of behavioural and analytical approaches
Lean Now in Turbine Engine Development / Sustainment Process

- Truly a capital “E” enterprise effort
  - Multiple programs, services and companies
- Preplanning scope of improvement effort
  - Based on overall enterprise (acquisition) with specific focus (engine testing)
  - Initiating at most senior, strategic and decision-making levels
  - Constituting team(s) with knowledgeable people and decision-makers
  - Facilitators with process knowledge and stakeholder links
- EVSMA event & follow up
Sustaining the Lean Movement in the Global Hawk SPO

- Initial Lean Now Project
- Embedding “lean” in spiral development process
- Challenges of sustaining change and continuous improvement
- Moving beyond program to customers and suppliers – how do you promote change?
Session Questions
Industry-Government Infrastructure

1. What enables and sustains improvement and change over time?
   - Leadership?
   - Programmatic focus?
     - (Did LESAT help Global Hawk?)
   - Today's (or yesterday's) success is not a predictor of tomorrow's success, especially when conditions change

2. What inhibits learning and implementing change?
   - Not enough time? Not enough help? Walking talk?
   - Anxiety? Measurement? True Believers?
   - Governance? Diffusion? Purpose?

Strategic Framework (TTL) or capability-based model (reinforcing & balancing forces)?
Session Questions
Industry-Government Infrastructure

3. What were the surprises that were learned in gaining
   • engagement,
   • alignment,
   • implementing change, and
   • sustaining improvement and change
   across organizations?

4. How do you address the cost vs. return question?
   • Who has the authority to make assessments of human capital investments?
     • easy to measure costs
     • hard to determine lost revenue/improvement
     • passion for investment in learning
     • need for intersection of passion and authority
Session Questions
Industry-Government Infrastructure

Summary of questions to presenters:

1. What enabled change?
2. What inhibited change?
3. What were surprises in gaining and maintaining change across organizations?
4. Costs of improvement program?