Learning From Case Studies
~ Enterprise Transformation at Rockwell Collins ~

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Research on Lean Enterprise

Cases builds off the

Customer

Employee Fulfillment

Quality Processes & Products

CU S T O M E R F OCUS

On Plan

Impro v e  Empl oye e Scor eca r d   by 0.5

EMPLOYEE  FUL FI LLM EN T

Off Plan

QU ALI TY PROCESS E S  & PR O DUC T S

Change the Game:

Prod. Rev.

Sta f- Train- Quali ty Actio n per Engine

work and the Army’s

fi ng

Mnt h

Rework

•Target 40 % div ers ity candi d at e s  on al l s late s

•Ach i ev e  eng i ne eri n g r e s tru cturing pr od uc ti v it y

330 % $1.2M 97% 17

PSA

000 % 2 0 97% 19

MPE

01 00 % 0 1 0 0 $ 0.0M 95% 16

Spa ce 01 N o  Data 3 7 1% No Dat a 99% 11

CAN

Mech Com p o nen ts

00 N o  Data 6 8 3% $ 0.7M $0.3M 28 2% 3

PRODUCTS

AC E-related Events

Management

Products & Services

Five related case study

1. ACE Operating Model

2. Lean in Construction

3. ACE at GE

4. Module Center: ACE in engineering

5. Deficiency Reporting: Pratt & Whitney, USAF, and DCMA cross-organizational improvement

United Technologies ACE

Company

Letterkenny Army Depot

6 years (1991-1996)

5 years (1993-1997)

10 years (1987-1996)

6 years (1991-1996)

10 years (1987-1996)

Company (two plant) case on bird houses and animal feeders (Liker 1999)

One production line producing underwater cables (Liker 1999)

Plant level case on control and sensor production (Ryckebusch 1996)

6 years (1991-1996)

5 years (1991-1995)

1995)

5 years (1996-1997)

2 years (1996-1997)

1997)

4 months (1996)

7 years (1990-1997)

1994)

2002

2001

2003

2005

2006

2007

Raytheon & Paveway

4 years (1992-1995)

Company - organizational level and change

Enterprise

Change

Lean

Research on

Change

Research on

Research on

Research on

1999

2001

2002

2005

2005

1997

Raytheon & Paveway

2002

Yoshiki Iwata

Had fallen several months behind in production; first US supplier taught

Garden State Tanning

Lean Plant case on leather automobile seats (Liker 1999)

Raytheon & Paveway

1999

1997

2 years (1996-1997)

1995)

6 years (1991-1996)

Plant level case on automobile steering columns (Liker 1999)

Freundenberg NOK (Liker 1999, Womack and Jones 1996)

One production line producing underwater cables (Liker 1999)

Company (two plant) case on bird houses and animal feeders (Liker 1999)

Lantech

Delphi Saginaw

Warner Robins ALC

United Technologies ACE

(understanding ↔ description)

web.mit.edu/lean

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Lean-centered Success

• Eight-year strategic initiative at Rockwell Collins (COL) branded as Lean Electronics\textsuperscript{SM}.
  • “Operational Excellence through Lean Electronics\textsuperscript{SM}” is a strategic frame.
  • Interwoven improvement efforts, Lean and complementary to it.
• Enabled successful responses to “burning platforms”:
  • 1998 cost reduction challenge by Boeing
  • 9/11/2001 airline industry reversal.
• Said to have enabled its well-regarded operational and financial performance.
• Study finds continued applications and successes, but challenges still exist.
Successful Performance
≈1996 to 2005

- As sales (+22%) and headcount (-2%) rebounded after 2001, net income* (+205%) soared.
- Inventory turns increased from 3.9x to 5.0x (28%).
- Customer value metrics trend to “perfection”.
- Peer comparisons are favorable: 4th quartile.

* Following 9/11-related charge.
1. Branding lean creates the score: Lean Electronics™

2. Outrunning a bear: crisis to continuous improvement

3. Alignment or overalignment: the relentless pursuit of improvement

4. Moving to an enterprise level: new challenges

5. Joining vision with analysis: creating the structure to endure
Lean Electronics℠ at Rockwell Collins

• Continual focus on improvement and waste reduction.

• Alternately vertical and horizontal in focus.
  • **Vertical**: rapid process improvement events, core process optimization, enterprise scorecard, lean accounting, six-sigma, and rapid product development.
  • **Horizontal**: value stream mapping, integrated performance management, LCVS management.

• Contribution of Lean efforts: “priceless”:
  • Costs not quantified.
  • Part of how we work, not separate or dedicated
  • Direct savings immeasurable but accepted.
  • Mixed-in with other improvement efforts.
  • Responsible for new business “wins”.

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Lean Enterprise Change

What does it take? … capabilities in each of the following areas

1. Rethinking organizational boundaries
   • Long-term system view that includes relationships across units and with suppliers and customers as a common value stream

2. Installing sets of innovations
   • Complementarities of changes beyond process improvement

3. Pulling and pushing change
   • Based on deeper cultural assumptions that enable a virtuous learning process within a “community of scientists”

4. Seeking growth opportunities
   • The positive vision for continual renewal

5. Distributing leadership
   • Interdependent roles in a system of leadership

Calling these the “five capabilities for enterprise change”
Capabilities...

- are resources, talents, and abilities of an organization and its people
- that have the potential for development and use, and in their use,
- create expected outcomes while further developing themselves

The *system* of change ~ leads to a ~ lean enterprise *system*

(understanding ← description) → theory → testing → prediction
Rockwell Collins has leveraged lean to support their enterprise transformation

... but...

Is Rockwell Collins a Lean Enterprise?
Sources of Secondary Data

Annual Reports

Dow Jones Factiva

Transcripts of Investor Calls

Newsletters

Academic Publications

Other Publications
A Principles-based Approach for Understanding Enterprises

1. Adopt a holistic approach to enterprise value creation.
2. Identify relevant stakeholders and determine their value propositions.
3. Focus on enterprise effectiveness before efficiency.
4. Address internal and external enterprise interdependencies.
5. Ensure stability and flow within and across the enterprise.
6. Cultivate leadership to support and drive enterprise behaviors.

Source: Nightingale & Srinivasan 2008
Holistic Growth Strategy

“grow revenue organically by reinvesting capital into innovation, research, and development, instead of growing revenue at all costs through large acquisitions”

– Schwendinger, Kanter and Reopel, July 2007, in AVIATION WEEK & SPACE TECHNOLOGY

• Balanced Portfolio

• Mergers and Acquisitions

• Stock Repurchase
Meeting the Needs of Key Stakeholders

“Rockwell Collins’s future depends on its ability to retain and develop people and on the ability of those people to provide winning solutions for customers around the world” - Clay Jones*

HUMAN CAPITAL

- Top Areas of Talent needs in A&D
- Value proposition for people
- Redesigned Hiring Process in 2005
  - Top Leadership Support
  - Climate of Organization Alignment
    - Time-to-Fill to Time-to-Critical Skills Delivery
  - Ambassador – Nan Mattai

COMMUNITY – Iowa Floods

- Manufacturing and administrative facilities were located away from the flood plain and "largely unaffected"
  - Established a fund to help employees who have suffered losses from the high water.
    - Payroll deduction, donating unused vacation time
  - Contributed $2 million to local recovery efforts.

Focusing on Effectiveness: R&D

“A company that is hitting on all cylinders at the operational level: Strong execution, steady growth in operating profit margins, a disciplined acquisition strategy and an innovative product pipeline underpinned by robust R&D spending” - Anselmo, 2007 in Aviation Week Technology

• Rockwell’s R&D Budget in 2008- 827 million
  • Expected 2008 expenditure – 950 million

• 2009 expenditure 925 mil. to $975 mil, updated from $950 mil. to $1 bil.
Addressing Internal and External Dependencies for Innovation

The 10X program
• Initiated in 2004 to foster disruptive thinking
• Launched with a budget of USD 500,000 – funded 8/46 ideas
• Expanded to US Engineering in 2nd year with USD 1 Million - 70+ ideas
• Third year - 180 proposals

Open Innovation
• Initiated in 2005 to answer the question of How do we collaborate smartly so that we can take ideas and come up with innovative solutions for our customers problems, faster and cheaper than our competitors?

http://leanit.mit.edu
Other On-Going Research

- Case studies of software organizations across software services, product development, and telecommunications

- Case study on open source software (with Danny Gagne)

- Boeing Phantom Works Project on Rapid Certification