



Lean Now Workshop

Presented By
LAI Lean Experts

January 2003



Agenda – Morning LAI Lean Now Workshop

- 0800 Welcome**
- 0805 Introductions - Ice Breaker**
- 0815 NASCAR Video**
- 0830 Fundamentals of Lean**
- 0915 Break**
- 0930 Lean Concepts and Tools**
- 1030 Manzana Insurance Case**
- 1150 Case for Action and Lunch Exercise**
- 1200 Lunch**



Agenda – Afternoon LAI Lean Now Workshop

1300 Team Discussion - Lunch Exercise

1330 Lean Enterprise

1400 Big Picture

- **Lean Now Support Structure**
- **Roles and Responsibilities**
- **LAI Overview and Tools**

1445 Break

1500 Leading Transformation

1530 Closing Comments

1600 Adjourn



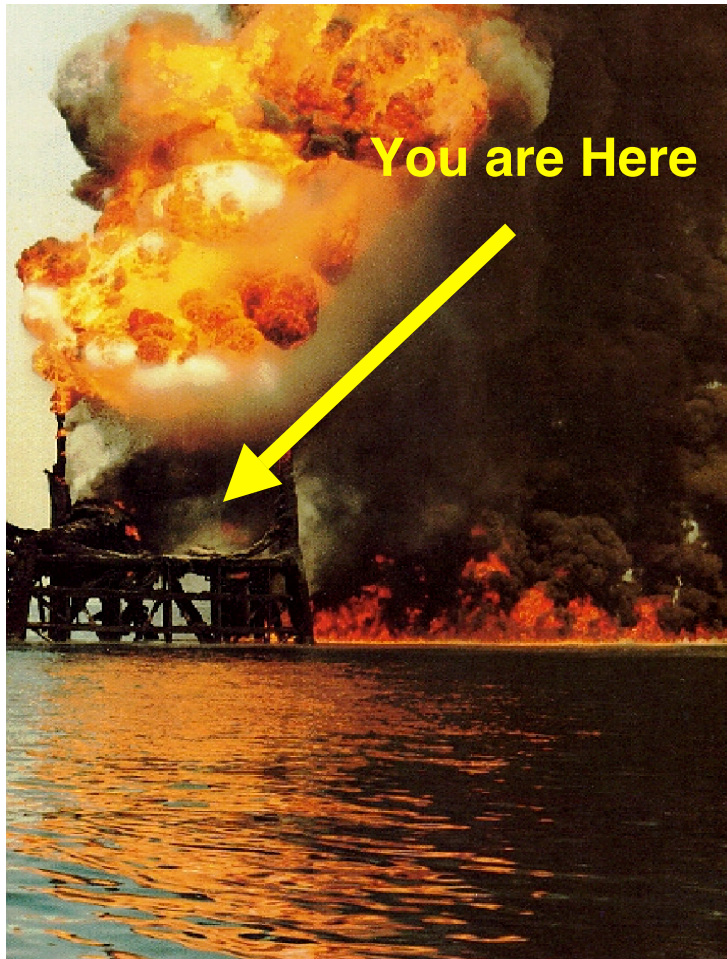
Introductions – Ice Breaker



Introductions

- Name/location
- Position/background (current - be general)
- Lean expertise (1-5, 5 being high)
- Something about you that is unusual or not common knowledge

The “Burning Platform” - Value Creation



- Value stream focus
 - Create value
 - Eliminate waste
 - Adapt quickly to new challenges
- Expeditionary mindset and culture
- Innovative, adaptive and responsive
- Get it faster with fewer resources



Lean Enterprise Value: The Central Concept

Lean is a process of eliminating waste with the goal of creating value for enterprise stakeholders.

-Lean Enterprise Value, Murman et al



NASCAR Video



Lean Works Everywhere

- **Export licensing:**
 - 56 steps to 21 steps
 - 52 handoffs to 5 handoffs
 - Cycle time from 60 days to 30 days
 - 50% 1st pass yield to >90% 1st pass yield
- **Payroll:**
 - Reduced non-value added steps by 50%
 - 15 forms to 1 form
 - Reduced signatures/ approvals by 25%
- **Recruiting:**
 - Cycle time from 14 days to 48 hours
 - 50% reduction of paper resumes
- **Proposal:**
 - Cycle time from 30.6 days to 7 days
- **Program support:**
 - \$3M savings
- **Interface management:**
 - Proposal, contract, billing, and collection steps
 - Generated \$21M additional cash
- **Engineering order release:**
 - Cycle time from 76 to 4 days
 - Total queue time from 56 days to 60 minutes
- **Process definition:**
 - Work package completion cycle from 4 months to 3 weeks
- **Financial reporting:**
 - 13 weeks to 3 weeks



Fundamentals of Lean



Lean was Born out of Necessity

August 15, 1945 -- end of war with Japan

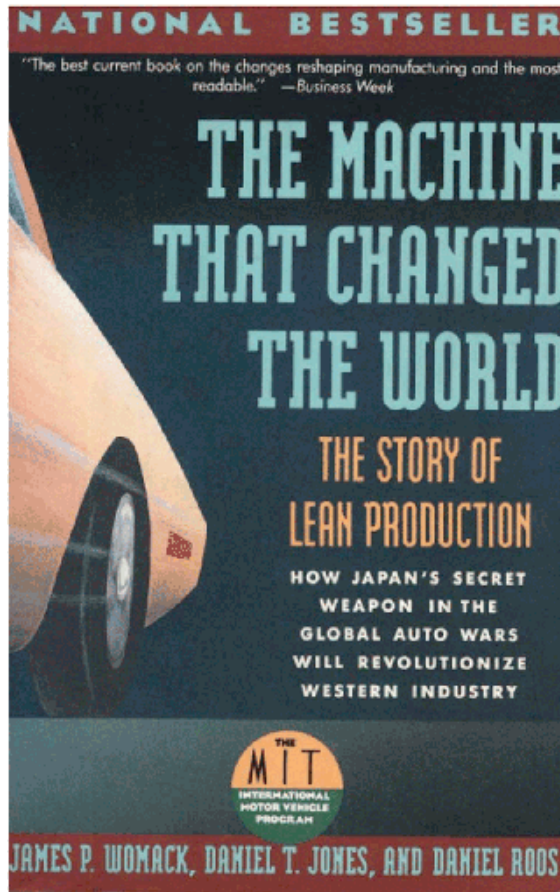
- Toyota faced a daunting challenge: How to succeed against Western mass production auto giants poised to enter Japanese market?
- Kiichiro Toyoda to Taiichi Ohno: “Catch up with America in three years.”
- Ohno’s challenge: How to design a production system exploiting central weaknesses of mass production model

Japan’s dilemmas

- Small & fragmented market, depleted workforce, scarce natural resources, little capital
- Lean evolved as a coherent response to this challenge over a number of decades -- a dynamic process of learning and adaptation later labeled as “lean production” by Western observers



Use Less, Offer Greater Variety, Higher Quality, and More Affordable Products in Less Time



- **Best Japanese auto companies developed a fundamentally different way of making things**
- **These companies changed the dynamics of international competition**
- **New goals in manufacturing systems -- combined benefits of craft and mass production**
 - Improved quality
 - High productivity
 - Efficiency at low volumes
 - Production flexibility
 - Rapid, efficient development cycle
 - Product mix diversity
- **Lean production contrasts with traditional mass production paradigm**
- **Systemic principles are transferable**



Lean Thinking: Eliminating Waste with the Goal of Creating Value

- **Customer-focused:** Customer needs and expectations “pull” enterprise activities
- **Knowledge-driven:** Draws upon knowledge and innovation from everyone - workers, suppliers
- **Eliminating waste:** Stresses elimination, not just reduction, of all types of waste
- **Creating value:** Puts premium on “growing the pie”, not just reducing costs, to benefit all stakeholders
- **Dynamic and continuous:** Pursues on-going systemic as well as incremental improvement - both innovation and continual improvement



Lean Provides Positively-Reinforcing Concepts, Practices and Tools

- **Delivering just-in-time:** “Pull” based production
- **Striving for perfect quality:** Completely defect-free parts must flow to each subsequent process; quality designed-in, not based on inspection, mistake proofing
- **Flexibility and responsiveness:** Small processing sizes and quick set-up times; ability to respond to shifts in demand
- **Trust-based relationships:** Mutual commitments and obligations, internally and externally with suppliers
- **Continuous improvement (Kaizen):** Continuous improvement through work standardization, productive maintenance, root cause analysis, and worker training and empowerment



Five Lean Fundamentals

- **Specify value:** Value is defined by customer in terms of specific products & services
- **Identify the value stream:** Map out all end-to-end linked actions, processes and functions necessary for transforming inputs to outputs to identify and eliminate waste
- **Make value flow continuously:** Having eliminated waste, make remaining value-creating steps “flow”
- **Let customers pull value:** Customer’s “pull” cascades all the way back to the lowest level supplier, enabling just-in-time production
- **Pursue perfection:** Pursue continuous process of improvement striving for perfection

Source: James Womack and Daniel T. Jones, *Lean Thinking* (New York: Simon & Schuster, 1996).

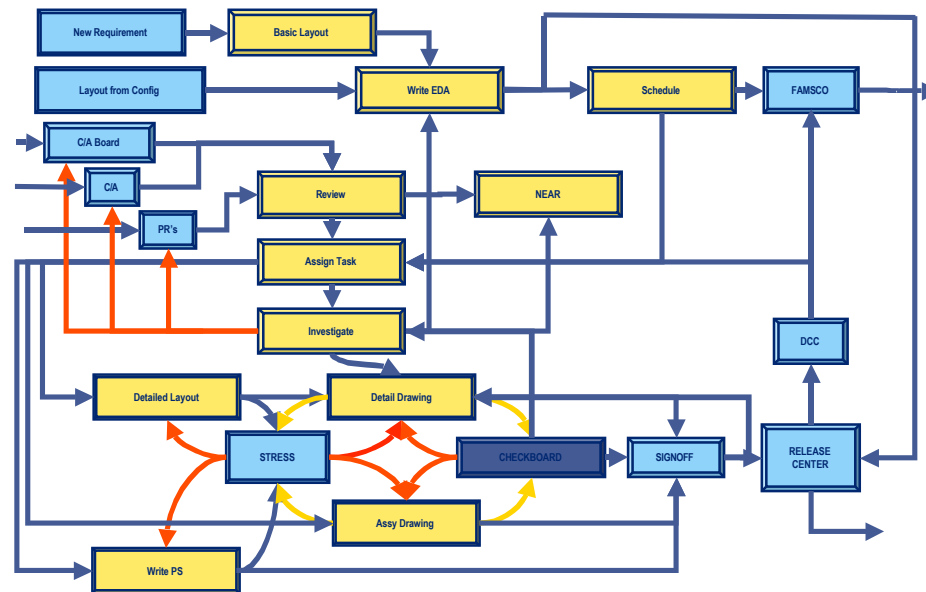


Lean Thinking is Linked to & Complements Other Systemic Change Initiatives

	Total Quality Management	Reengineering	Traditional Six Sigma	Lean
Goal	Meet Customer Expectations	Breakthrough Solutions	Reduce Variation in all Enterprise Operations	Eliminate Waste to Create Value
Focus	Product Quality	Business Processes	All Sources of Product Variation	All Enterprise Processes & People
Scope	Business Unit	Business Unit	Enterprise	Enterprise Value Stream
Change Process	Incremental	Radical Change	Process-specific; continuous	Evolutionary Systemic Change
Business Model	Improve Efficiency & Shareholder Value	Increase Enterprise Performance & Customer Value	Minimize Waste & Increase Customer Satisfaction	Deliver Value to all Stakeholders

Only Understood Processes Can Be Improved

- Establish models and/or simulations to permit understanding
- Ensure process capability & maturation
- Maintain challenge of existing processes

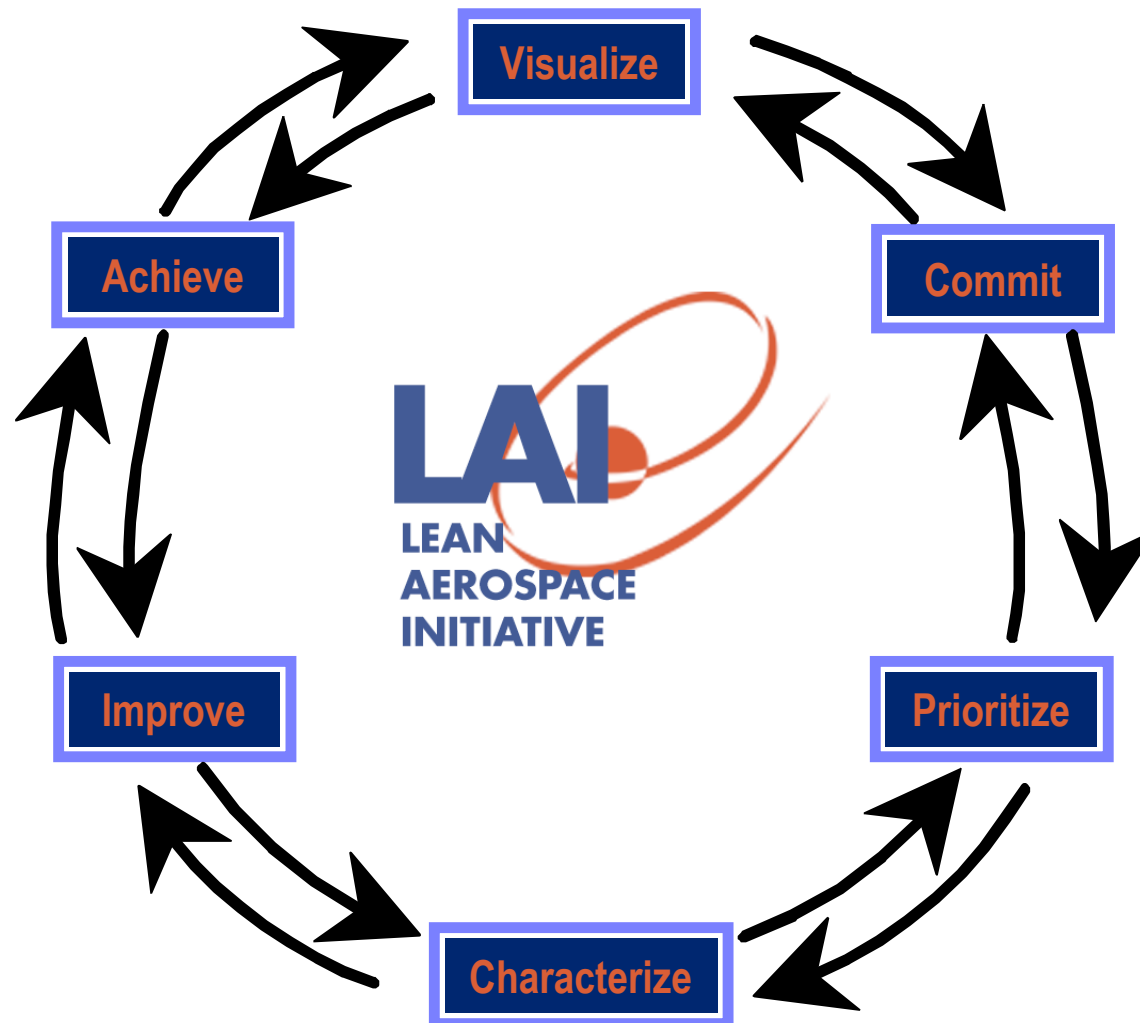




Lean Concepts and Tools



Continuous Improvement Process





Continuous Improvement Process

Visualize: Imagine the Future

- Define case for action
- Visualize desired future state
- Establish goals
- Align with department goals

Achieve: Hold the Gains, Celebrate Achievements, Build for Tomorrow

- Test for meeting established goals
- Recognize achievements
- Capture lessons learned
- Plan for further improvements

Commit: to Change

- Secure sponsorship
- Define scope

Prioritize: Determine Improvement Priorities)

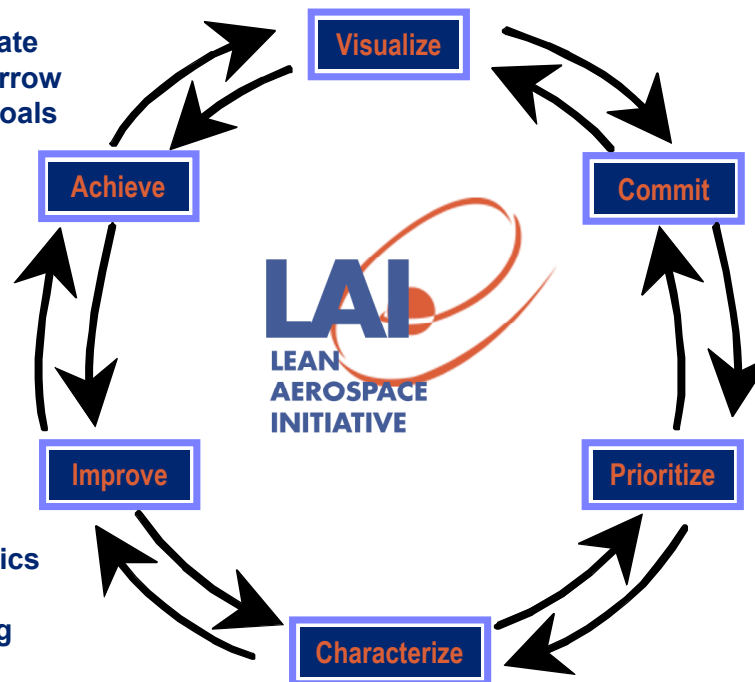
- Define current state
- Understand undesirable effects
- Determine root causes
- Develop alternative solutions
- Select solution, secure authority to proceed

Improve: Design & Implement Improvements

- Design the new solution
- Design the control system and metrics
- Plan implementation
- Plan and conduct necessary training
- Implement

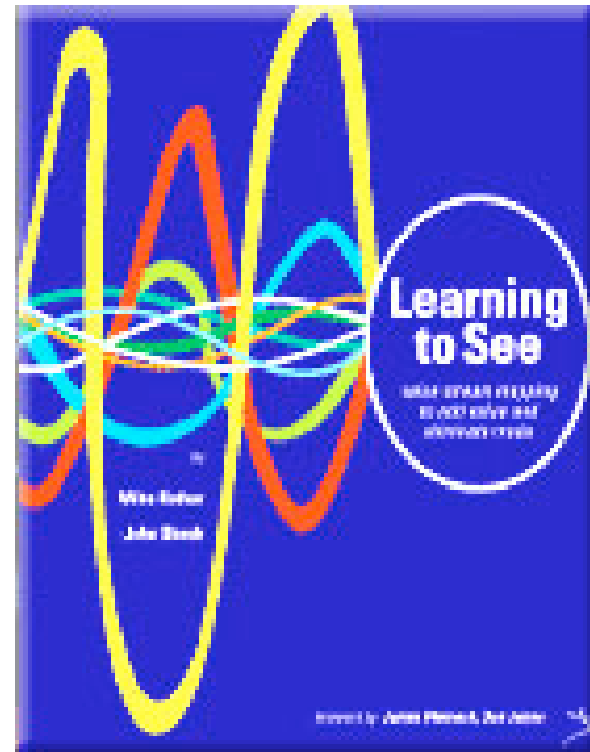
Characterize: Define Existing Process/Leverage Points

- Collect additional data, if needed to design solution
- Characterize control systems affected by the desired improvement
- Validate project goals, schedule and cost



Value Stream Mapping or VSM

- Tool used to visualize a process in order to “see” the value
- Provides a systematic method to improve a process by eliminating waste
- Creates “as is” and “to be” depictions of a process
 - Where you actually are, where you want to be, and how to get there

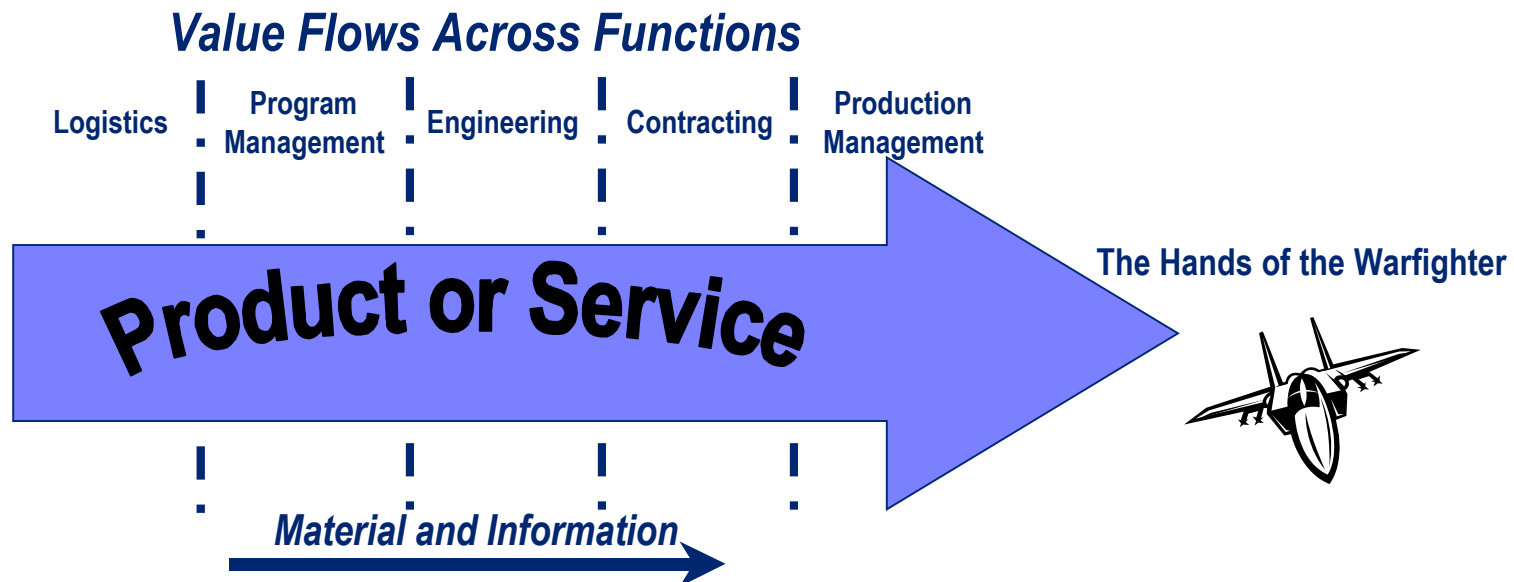


A good reference:
M. Rother and J. Shook, *Learning to See*, Lean Enterprise Institute, 1998

What is a Value Stream?

A value stream is...

- ALL the activities that create value
- Starts with raw materials or initial information
- Ends with the end-customer
- Involve several businesses
- Typical only a portion of the overall value stream is analyzed





What Flows Through a Value Stream?



“Material Flow”

In Manufacturing... materials are what flows

In Services...internal and external customer needs and information are what flows



“Information Flow”

Identify and Remove Impediments to Flow



Why is VSM a Useful Tool?

- Helps visualize interactions and flows
- Helps identify not only wastes but their sources as well
- Provides a common language for talking about a process
- Makes decision flows apparent
- Forms the basis of an implementation plan
- Shows the linkages between information and material flows
- Identifies the constraint(s) - any resource whose capacity is less than customer demand

Source: M. Rother and J. Shook, *Learning to See*, Lean Enterprise Institute, 1998

Basic Steps to VSM

1. Define the boundaries
2. Define the value
3. “Walk” the process
 - Identify tasks and flows of material and information between them
4. Gather data
 - Identify resources for each task and flow
5. Create the “Current State” map
6. Analyze current conditions
 - Identify value added and waste
 - Reconfigure process to eliminate waste and maximize value
7. Visualize “Ideal State”
8. Create the “Future State” map
9. Develop action plans and tracking

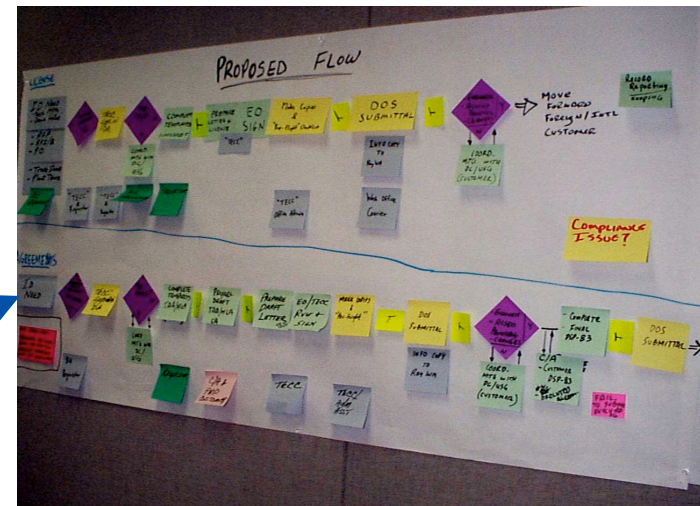


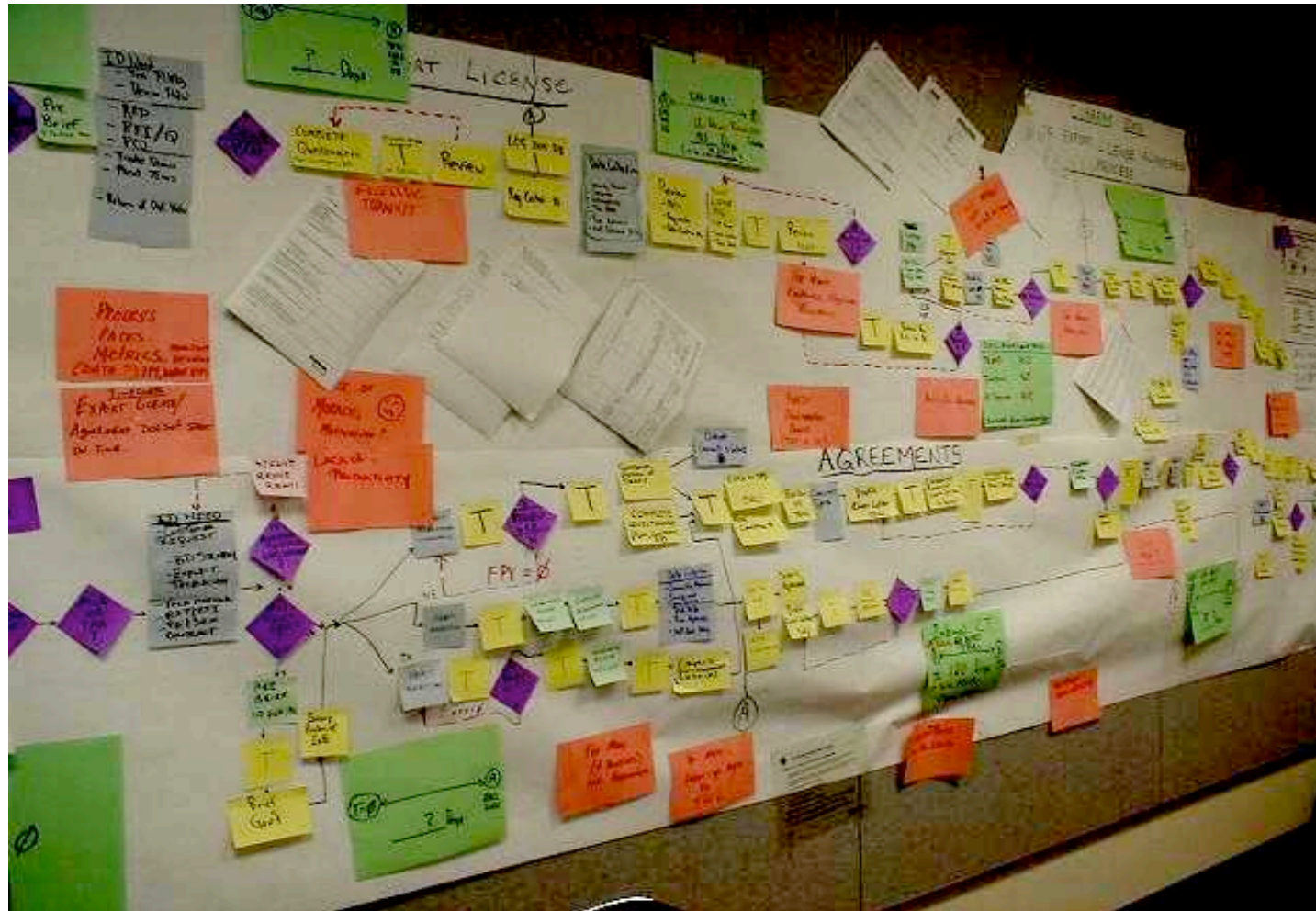
Photo source: Raytheon



Tips for Creating a VSM

- Involve entire team
- Actually walk the process - follow the material and information through the process, starting at the beginning
- Use post-it notes and butcher paper
- Use symbols or icons that are meaningful to the process but common enough to be understood by all involved

Administrative Process Value Stream Map - Current State



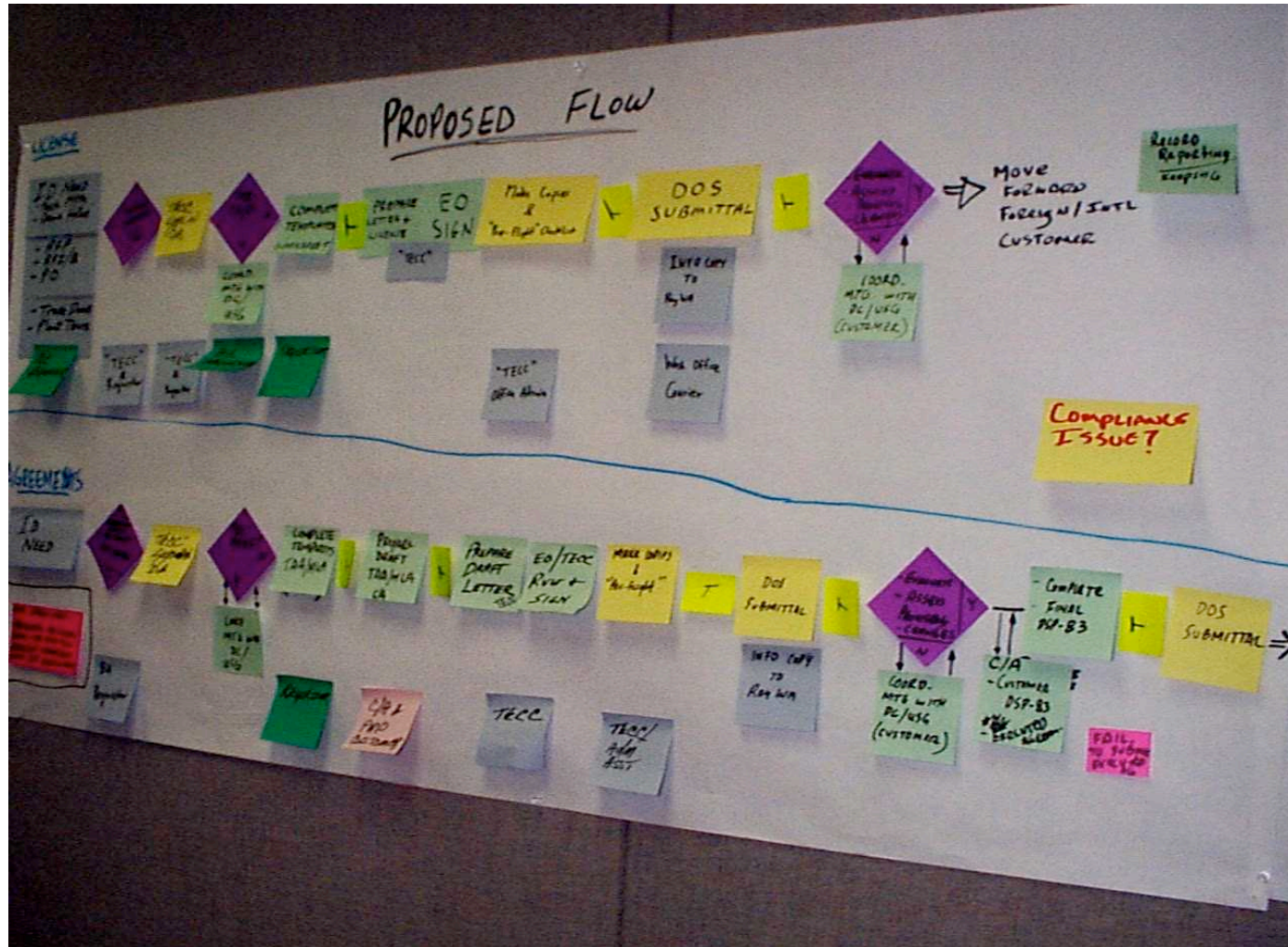
Process Steps:
56

Handoffs:
52

Cycle Time:
60 days

1st Pass Yield:
50%

Administrative Process Value Stream Map - Future State



Process Steps:
 21

62% reduction

Handoffs:

5

90% reduction

Cycle Time:

30 days

50% reduction

1st Pass Yield:

100%

100% improvement

Keys for Success with VSM

Follow the Process

- Remember that value stream mapping & analysis is a process
- Avoid short-cuts...the steps are important!
- Remind yourself and your team to be disciplined

"We can skip this step"

"We already know how we
want to make this"

"Let's not worry about that
for now"

Learn by Doing!

This

Process

Works!!

Analyze the Current Condition

Complete Red-Yellow-Green Dot Analysis



Value-Added Activities

- An activity that transforms or shapes material or information
- And the customer wants it
- And it's done right the first time



Non Value-Added – Needed Activities

- Activities causing no value to be created but which cannot be eliminated based on current state of technology or thinking
- Required (regulatory, customer mandate, legal)
- Necessary (due to non-robustness of process, currently required; current risk tolerance)



Non Value-Added Activities

- Activities that consume resources but create no value in the eyes of the customer
- Pure waste
- If you can't get rid of the activity, it turns to yellow

The Goal is to Eliminate Waste

Types of Waste

- Defects
- Over Production
- Transportation
- Movement
- Waiting
- Inventory
- Over Processing





The Seven Types of Waste In Business Processes

Defects

incorrect data entry

Over Production

preparing extra reports, reports not acted upon, multiple copies in data storage

Transportation

extra steps in the process, distance traveled

Movement

extra steps, extra data entry

Waiting

processing monthly, not as the work comes in (i.e. closings)

Inventory

transactions not processed

Over Processing

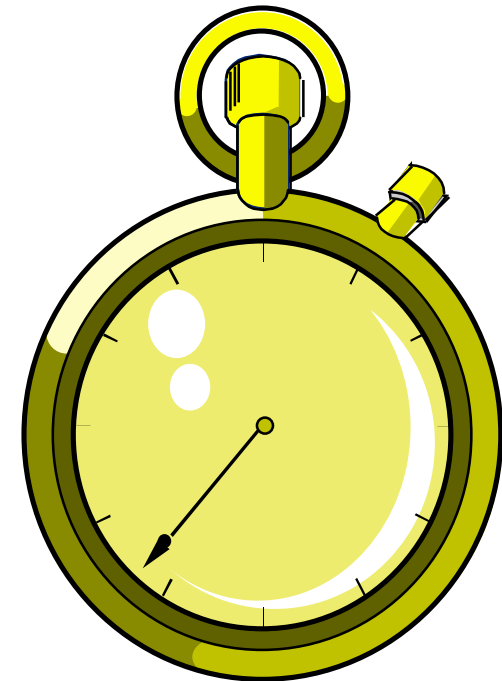
sign-offs

What is Cycle Time?

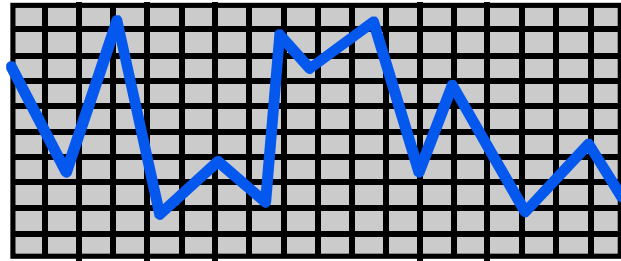
- Cycle time is the time required to execute activities in a process
- This could be:
 - A single process
 - A single task or activity
 - A group of tasks or activities
 - Customer order to customer delivery
- Cycle time includes actual processing time, as well as any waiting time (in calendar days)

Dynamic Cycle Time (Little's Law)

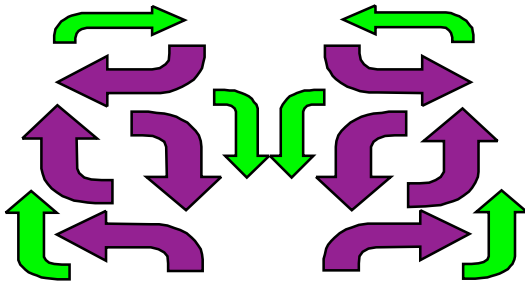
$$\text{Cycle Time} = \frac{\text{work in process (WIP)}}{\text{throughput rate}}$$



What Makes Cycle Time High?



Product flow variability

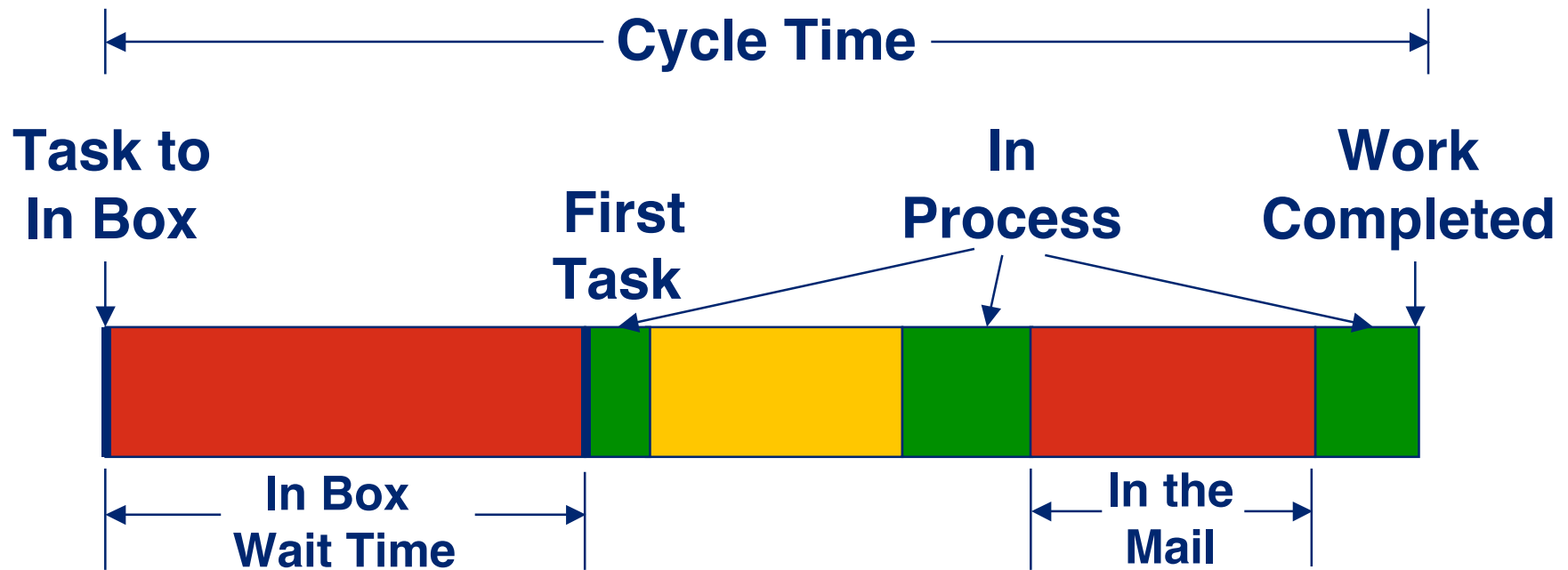


Complexity of processes



Inventory or work in progress (WIP)

Time Value Charts





Components of Cycle Time - An Example -

Total actual cycle time **43 days**

Processing Time:

Value added processing **3 days**

Non-value added processing **9 days**

Wait Time:

For processing **31 days**

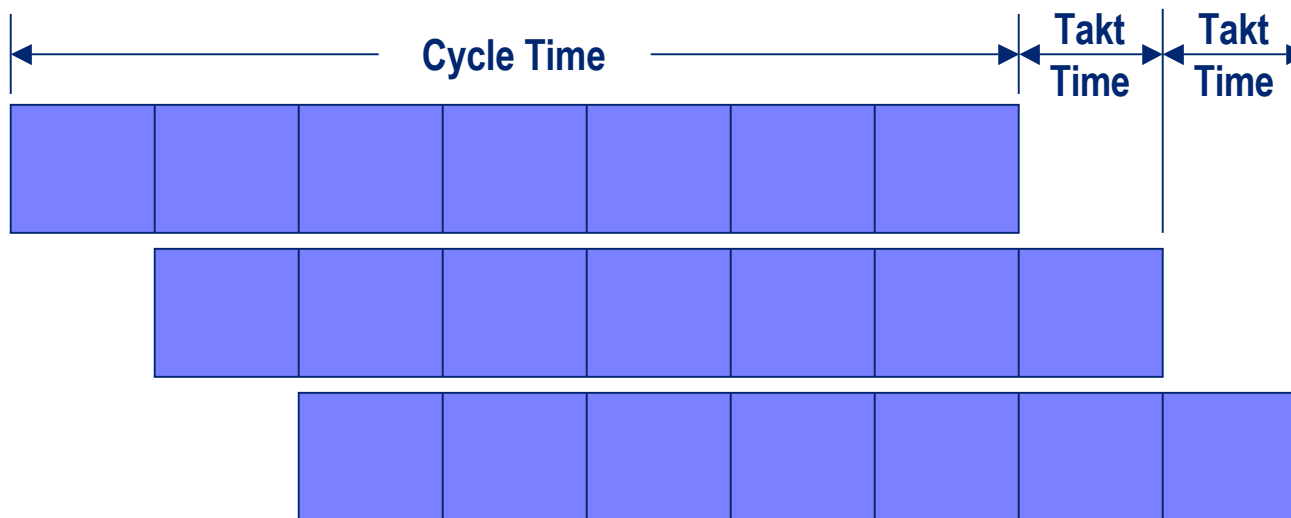
The big cycle time savings comes from the reduction of time product spends waiting in front of these operations

Takt Time - Measure of Customer Demand

Takt Time is...

- from the German word for meter which establishes the pace or beat
- a reference number that provides a drum beat for the process

$$\text{Takt Time} = \frac{\text{available time}}{\text{customer demand rate for available time}}$$





Level Loading Work

Incoming Order Requests

	<u>Week 1</u>	<u>Week 2</u>	<u>Week 3</u>	<u>Week 4</u>
Monday	5	4	6	4
Tuesday	0	1	2	1
Wednesday	1	1	0	1
Thursday	3	2	3	3
Friday	1	0	1	1

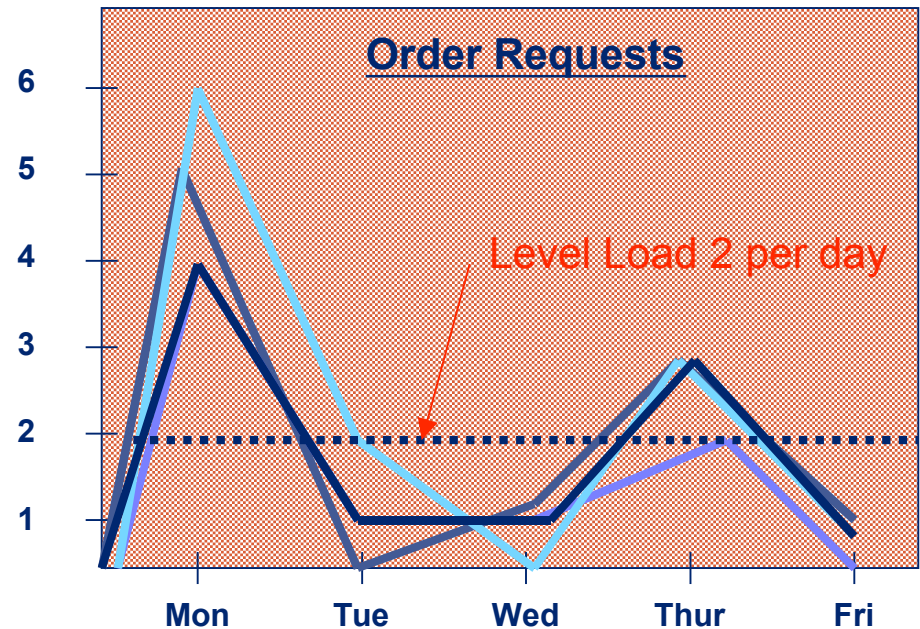
Average Order Requests Per Day

Week 1 = $10/5 = 2$ per day

Week 2 = $8/5 = 1.6$ per day

Week 3 = $12/5 = 2.4$ per day

Week 4 = $10/5 = 2$ per day



Standard Work



- Best process currently **known, understood, and used** today
- Tomorrow it should be better based on continuous improvement
 - Standard work must be revised to incorporate improvements



Case Study – Manzana Insurance



Observations Discussion

- Group discussion (30 minutes)
- Each group identify possible reasons for Manzana's difficulties in reducing turn-around times
- Consider possible solutions based on lean tools discussed this morning
- Group Report Out



Process Discussion

Some Reasons for long turnaround time:

- Varying priorities
- Work load distribution
- Poor scheduling
- Process variation
- Waste



Discussion - Takt Time

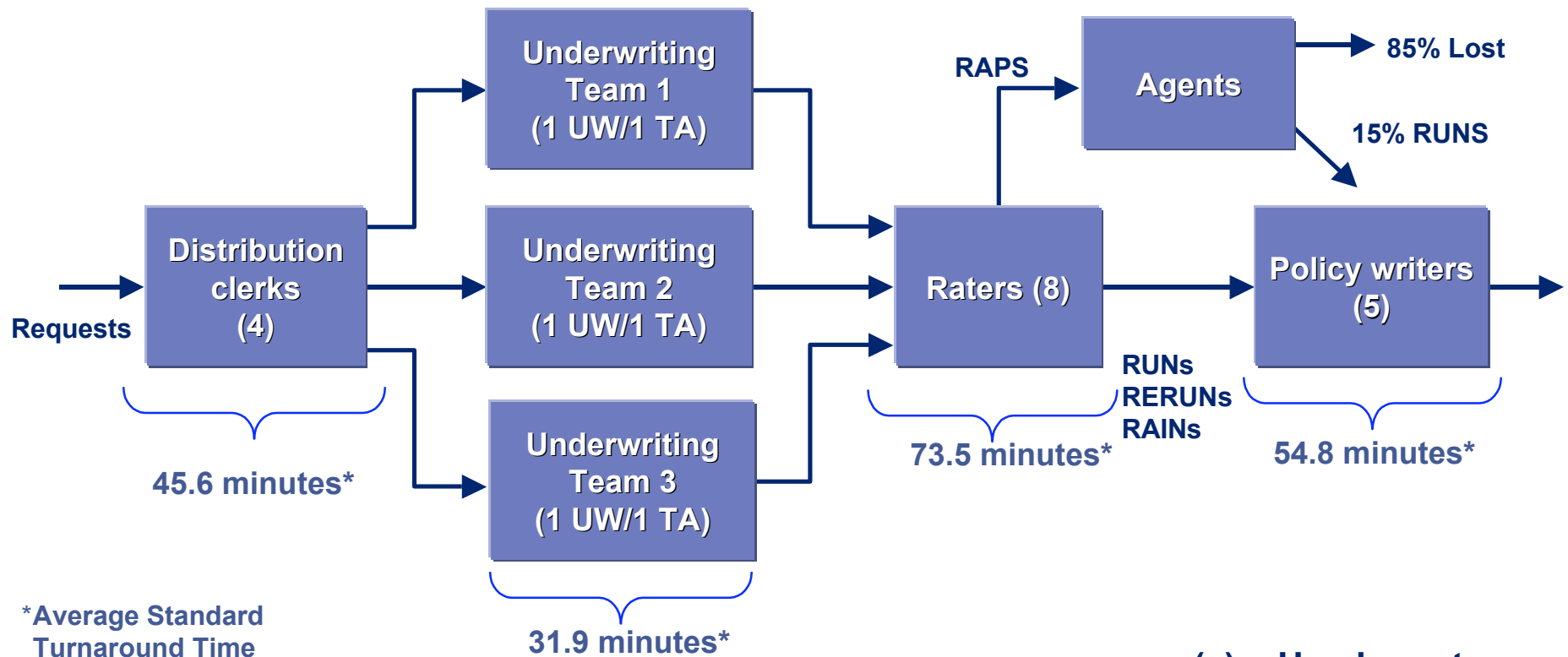
Is one-day turnaround (as promised by competitor), even feasible at Fruitvale Branch?

- Takt Time calculations
 - 40 requests per day (RUNs, RERUNs, RAINs, RAPs)
 - 7.5 hr/day X 60 minutes/hr = 450 available minutes per day
 - Takt Time (T/T) = available time/requests
 - $T/T = 450/40 = 11.25$ minutes per request

T/T = 11.25 minutes

Discussion - Process Capability

“As-Is” Operations Flow (Exhibit 2)



*Average Standard Turnaround Time (Exhibit 4)

(x) = Headcount

Discussion - Standard Work Sheet

“As-Is” Standard Work Sheet





Suggested Changes

What changes would need to be incorporated to accomplish one-day turnaround time?

- Process redesign “Lean Flow” (perform to takt)
- Utilize true FIFO (no need to schedule due dates)
- Utilize RERUNs to level-load demand if necessary
- Distribute underwriting work evenly by abolishing dedicated teams (balance line)
- Use standard work to reduce process time variations
- Other?



Transition to New Process

How could the transition to the new process be accomplished?

- Leadership
- Communication
- Managing the cut-over to the new process
 - Starting at the end of the process
 - Phased approach to minimize disruption
 - Managing the backlog



Case For Action

Insert Prototype Name

Prototype Description:

One or two sentences that describe the team's task.

Preliminary Objectives:

The objectives are the measurable outcomes that the sponsor desires from the prototype. Usually two or three measurable objectives along the lines of reducing cycle time, handoffs, approvals, defects and/or costs are included. .

Value :

The Value to the end customer is... ?

The portion of the value-added by this prototype area is ...?

Process Information:

Should include:

- Prototype boundaries (where does this process begin & end)
- Any commandments or monuments
- Listing of available process data

Start Date:

Team Leader: Person responsible for pre & post work follow up.

Co-Leader:

Team Members: People that need to participate on the team

Process Owner: Person(s) who owns the process

LAI Lean Expert: Person who will facilitate the event

Case For Action:

One or two sentences that describe the problem the team is addressing and answers the "Why This Prototype, Why Now?" question



Contract for Change

We, the Leadership, pledge to support the Lean transformation through the following actions:

- We will write and communicate a vision and strategy for the area which makes the Lean Transformation
- We shall appoint a “Core Team” which will figure out the specific approach to Lean for this area
- We shall participate in the Value Stream Analysis by attending the daily or weekly outbriefs, consensing on major opportunities and improvement approaches and finally signing the contract for change
- We shall lead the improvement process through our work on the Steering committee and shall assign appropriate resources to ensure that the transformation is successful



Contract for Participation

- I will focus my energy for the next 3 months on doing a complete and thorough analysis to help determine the path to the future
- I will work cross-functionally and keep an open mind
- I will solicit participation from other key stakeholders and do a good job of communicating the intent to all who input to the process
- I will seek to rely on “facts” to guide the decisions that the team recommends



Lunch Exercise



5 and 5

5 Opportunities

- 1.
- 2.
- 3.
- 4.
- 5.

5 Obstacles

- 1.
- 2.
- 3.
- 4.
- 5.

Monuments



Agenda – Afternoon LAI Lean Now Workshop

1300 Team Discussion - Lunch Exercise

1330 Lean Enterprise

1400 Big Picture

- **Lean Now Support Structure**
- **Roles and Responsibilities**
- **LAI Overview and Tools**

1445 Break

1500 Leading Transformation

1530 Closing Comments

1600 Adjourn



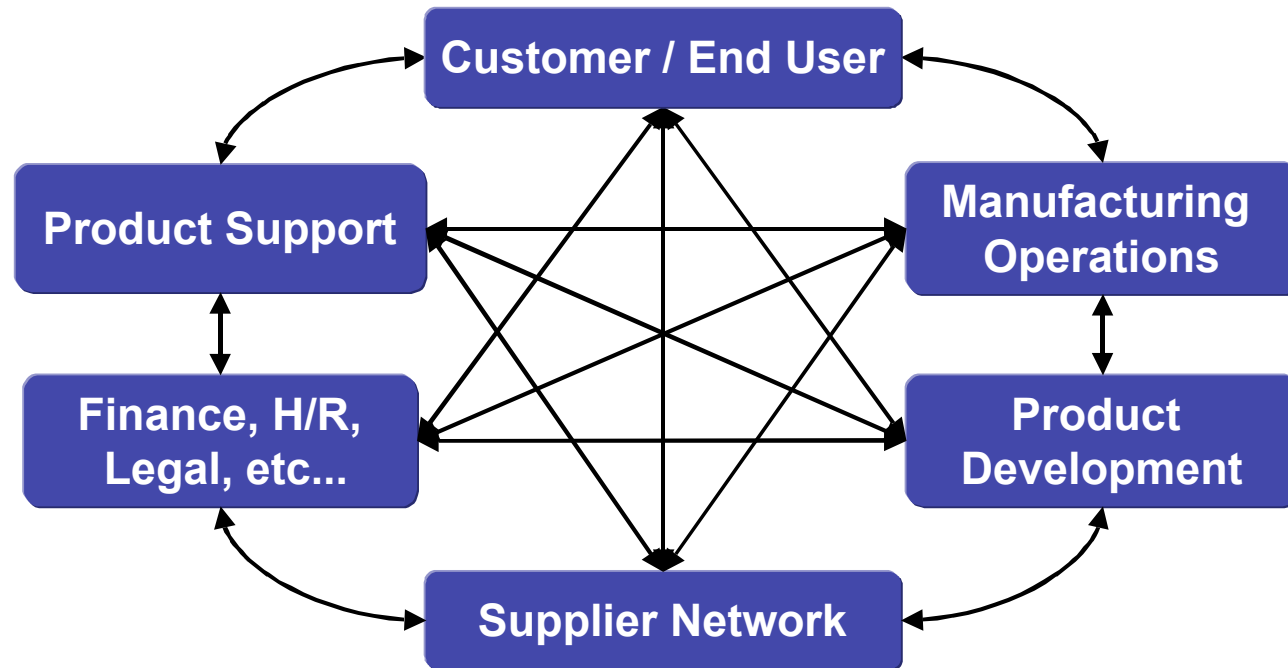
Team Discussions - Lunch Exercise

Goal: Identify 5 and 5 for the team



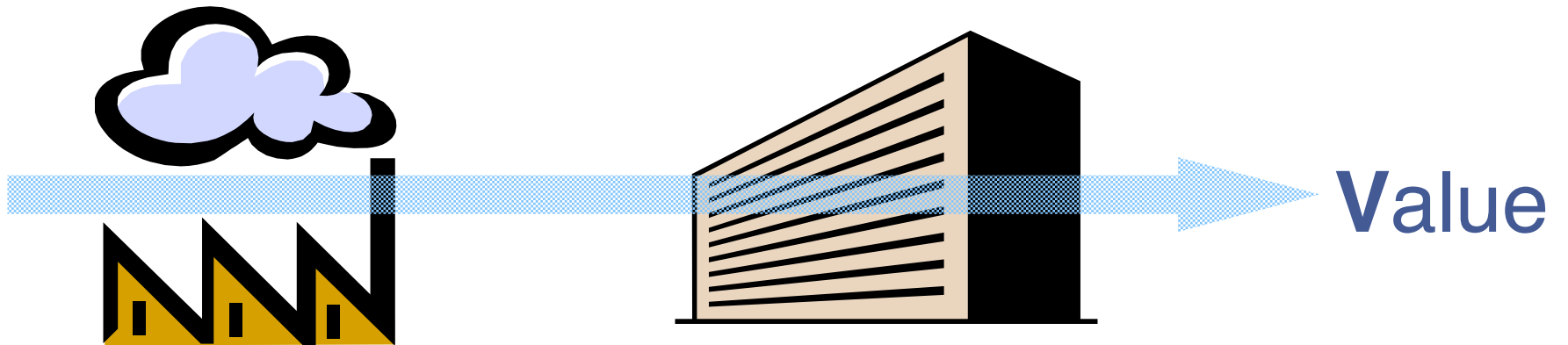
Developing an Enterprise View “The Lean Enterprise”

Enterprise Defined

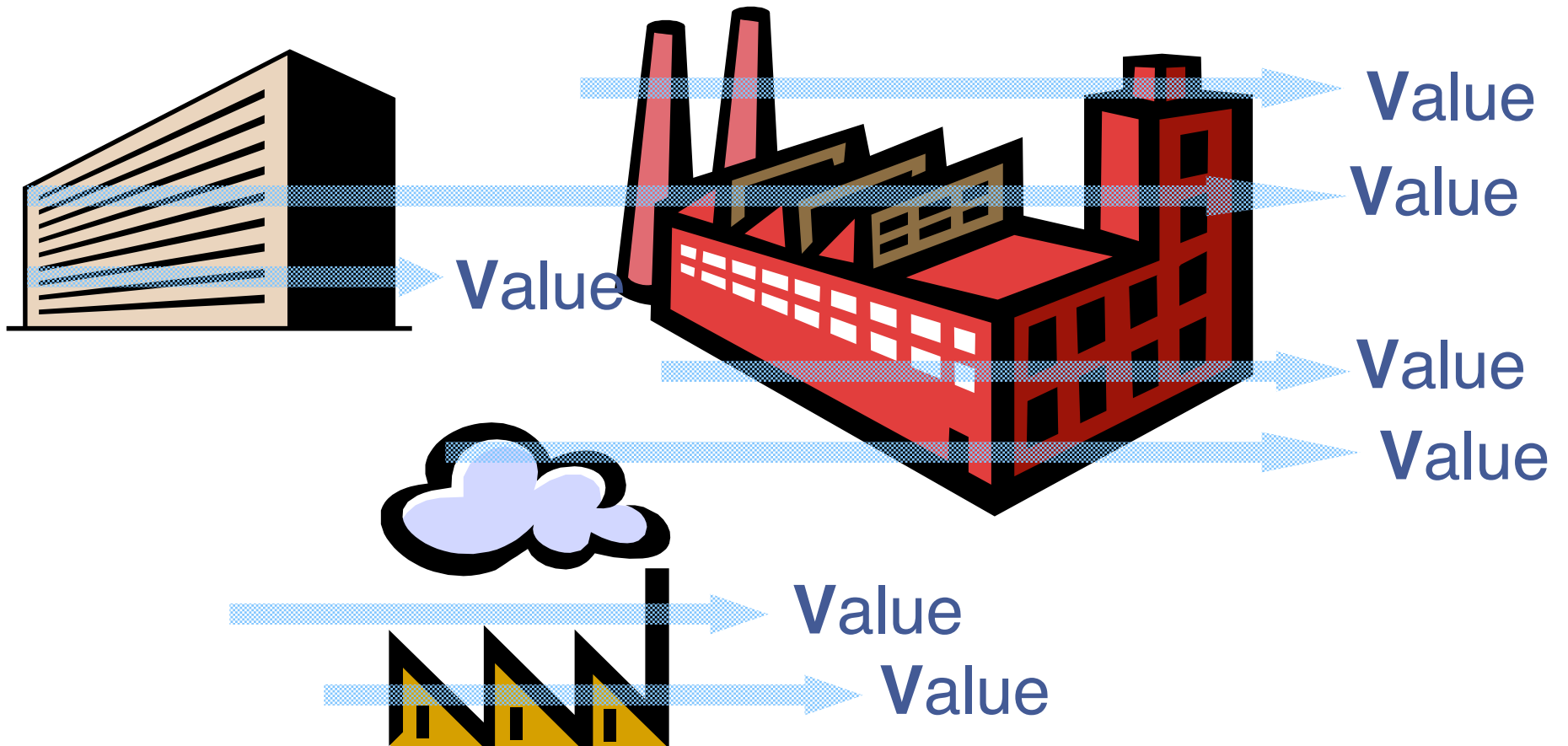


“One or more organizations having related activities, unified operation, and a common business purpose”

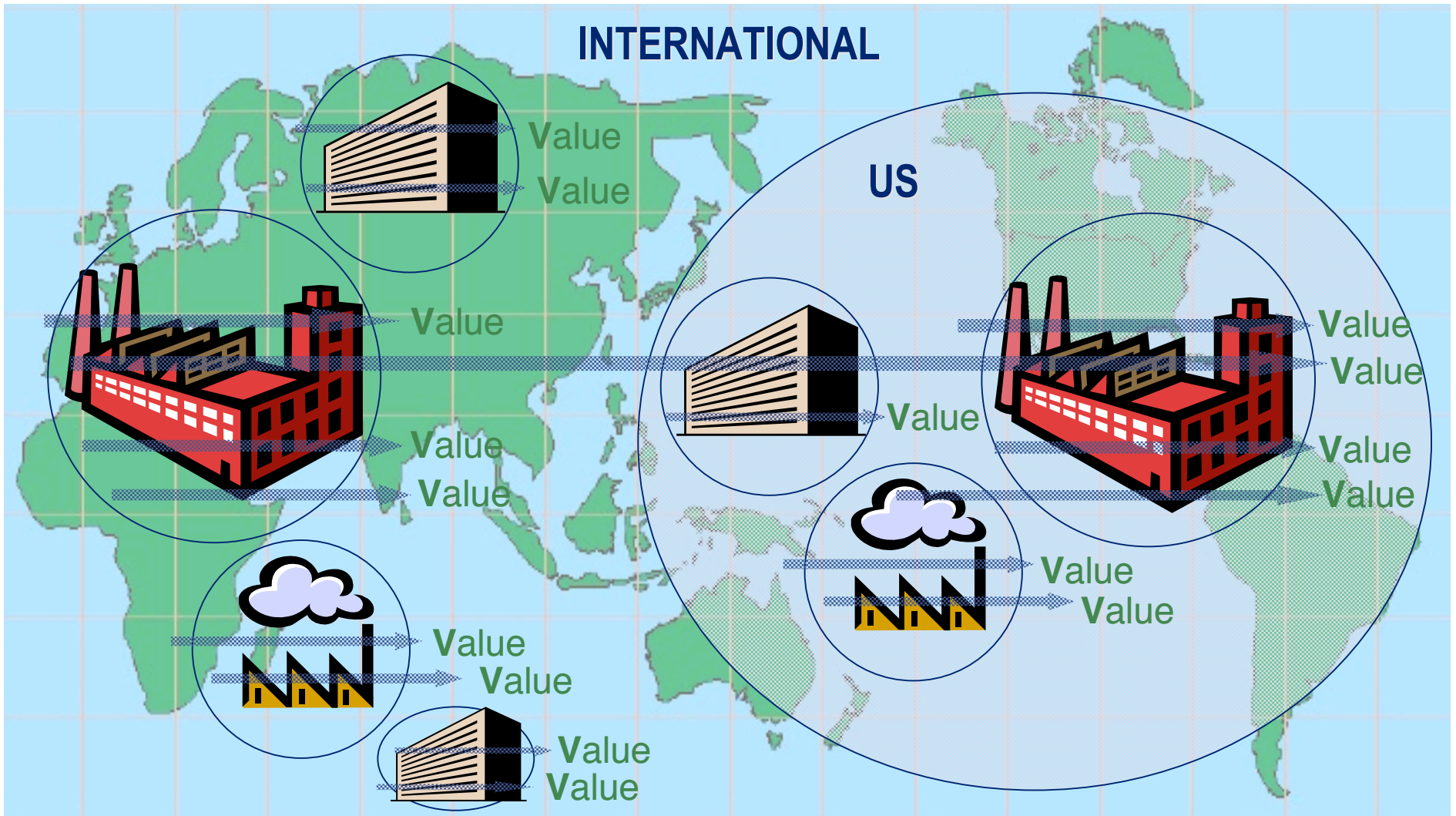
Program Value Stream



Multi-Program Value Stream



National and International Value Stream





Identify Three Levels of Enterprises

Program

F/A-22

Multi-Program

**Boeing, USAF,
Lockheed Martin**

National or International

**Primes,
Suppliers,
Government**



JSF Example of a Program Enterprise

Centralized Control

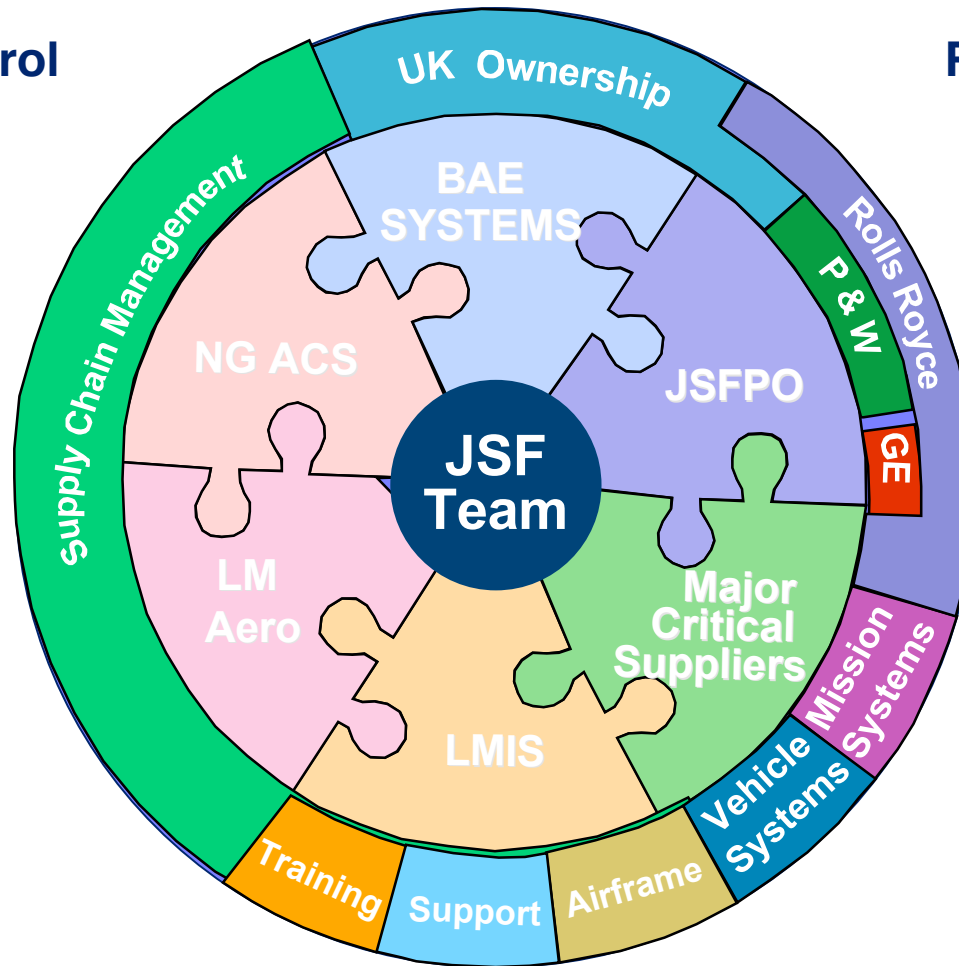
Rapid Decision Making

Decentralized Execution

Flexible Repositioning

Status at a Glance Metrics

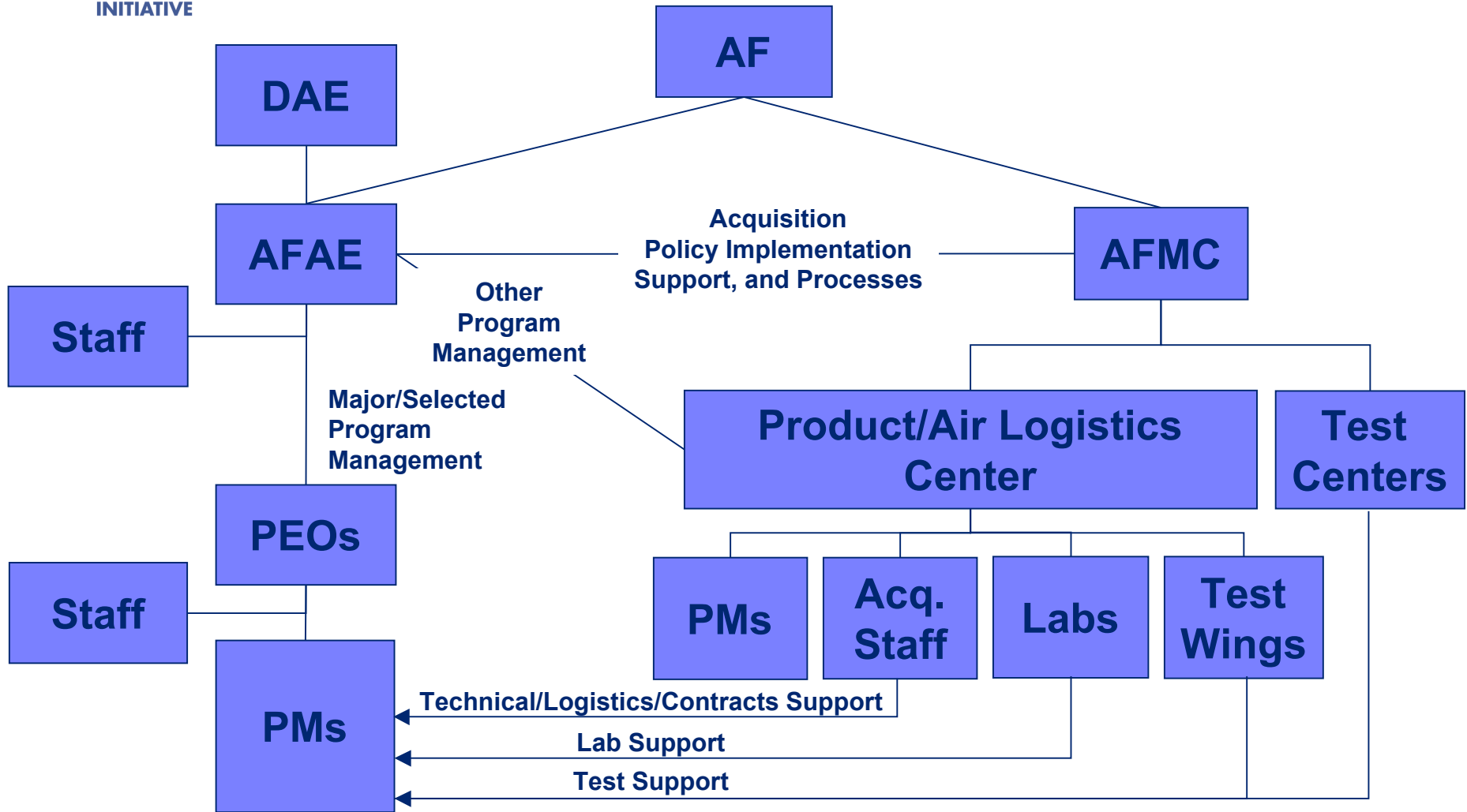
World Class Team



Source: Lockheed Martin Aeronautics Co. "JSF - A Winning Environment". Presentation at MIT. Mar. 6, 2002



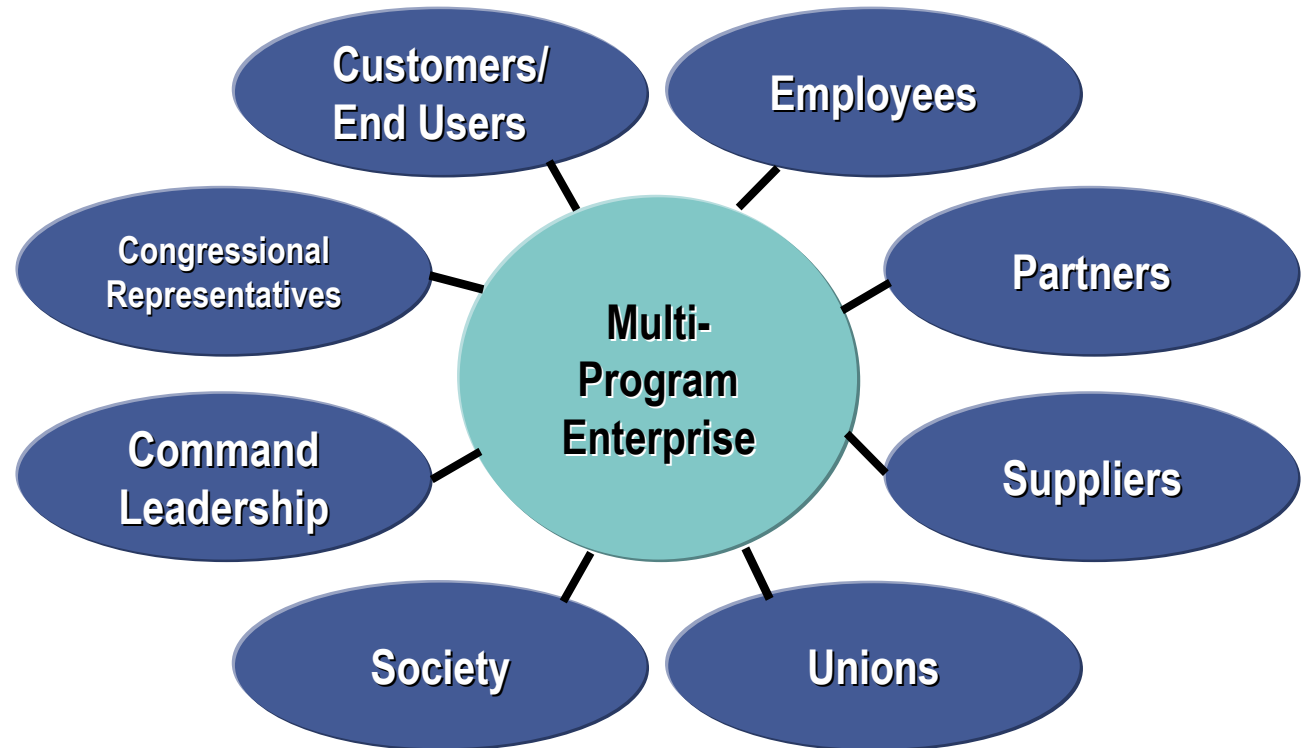
Air Force Acquisition Enterprise



Source: Pinney, Lt Col C. W. "The USAF PEO/DAC/MAD Structure:..." *Acquisition Review Quarterly*, Winter 1999

Stakeholder Defined

“Any group or individual who can affect or is affected by the achievements of the organization’s objective”



Source: Freeman, *Strategic Management: A Stakeholder Perspective*, Pittman, 1984



Define Enterprise in a Lean Context

“A lean enterprise is an integrated entity that efficiently creates value for its multiple stakeholders by employing lean principles and practices.”

Source: Murman et al., *Lean Enterprise Value*, Palgrave, 2002



Identify the Focus of Lean Enterprises

- Waste minimization
- Responsiveness to change
- Right thing at right place, and in right quantity
- Effective relationships within the value stream
- Continuous improvement
- Quality from the beginning



LEM Overarching Practices

Address People and Process

People Practices

- Promote lean leadership at all levels
- Relationships based on mutual trust and commitment
- Make decisions at lowest appropriate level
- Optimize capability and utilization of people
- Continuous focus on the customer
- Nurture a learning environment

Process Practices

- Assure seamless information flow
- Implement integrated product and process development (IPPD)
- Ensure process capability and maturation
- Maintain challenges of existing processes
- Identify and optimize enterprise flow
- Maintain stability in changing environment

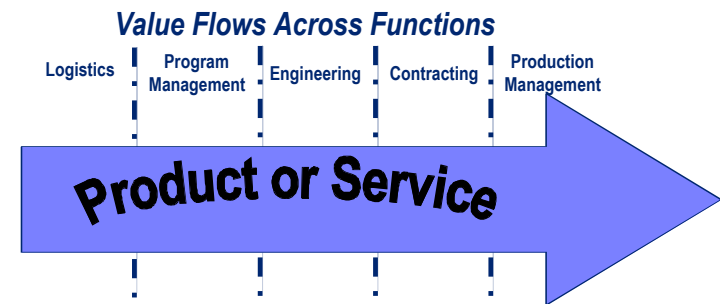
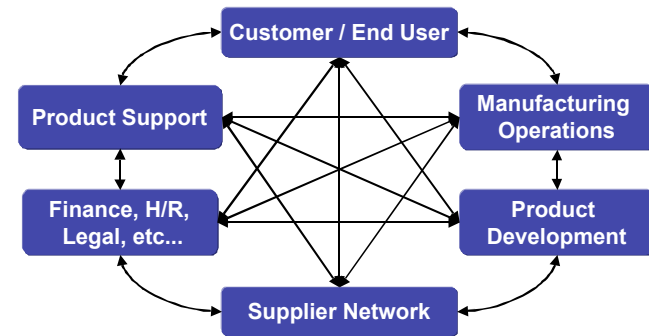
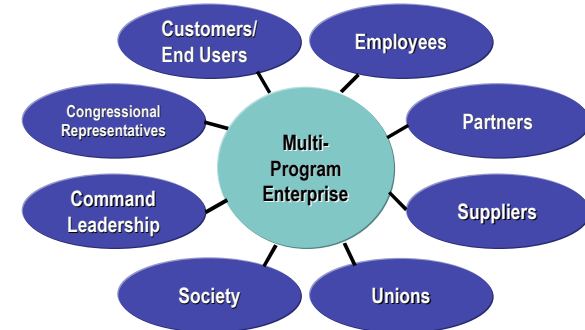


Identify Principles Applicable to Lean Enterprises

- Create lean value by doing the job right *and* by doing the right job.
- Deliver value only after identifying stakeholder value and constructing robust value propositions.
- Fully realize lean value only by adopting an enterprise perspective.
- Address the interdependencies across enterprise levels to increase lean value.
- People, not just process, effectuate lean value.

Lean Thinking Focus on Enterprise, Process, Lifecycle

- Enterprise perspective
- Process focus
- Functional integration
- Lifecycle orientation

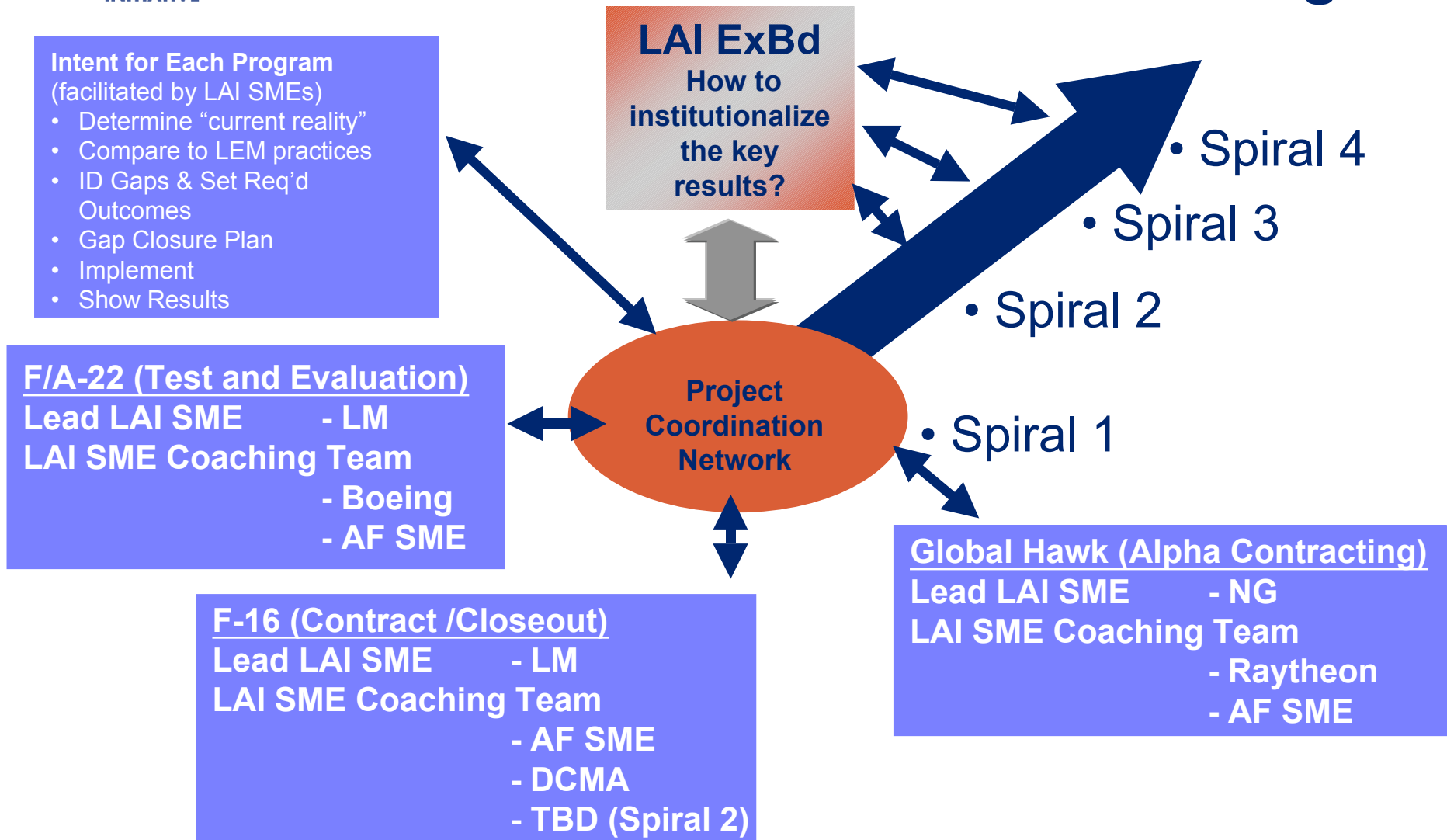




Big Picture



Leverage and Institutionalize the Findings



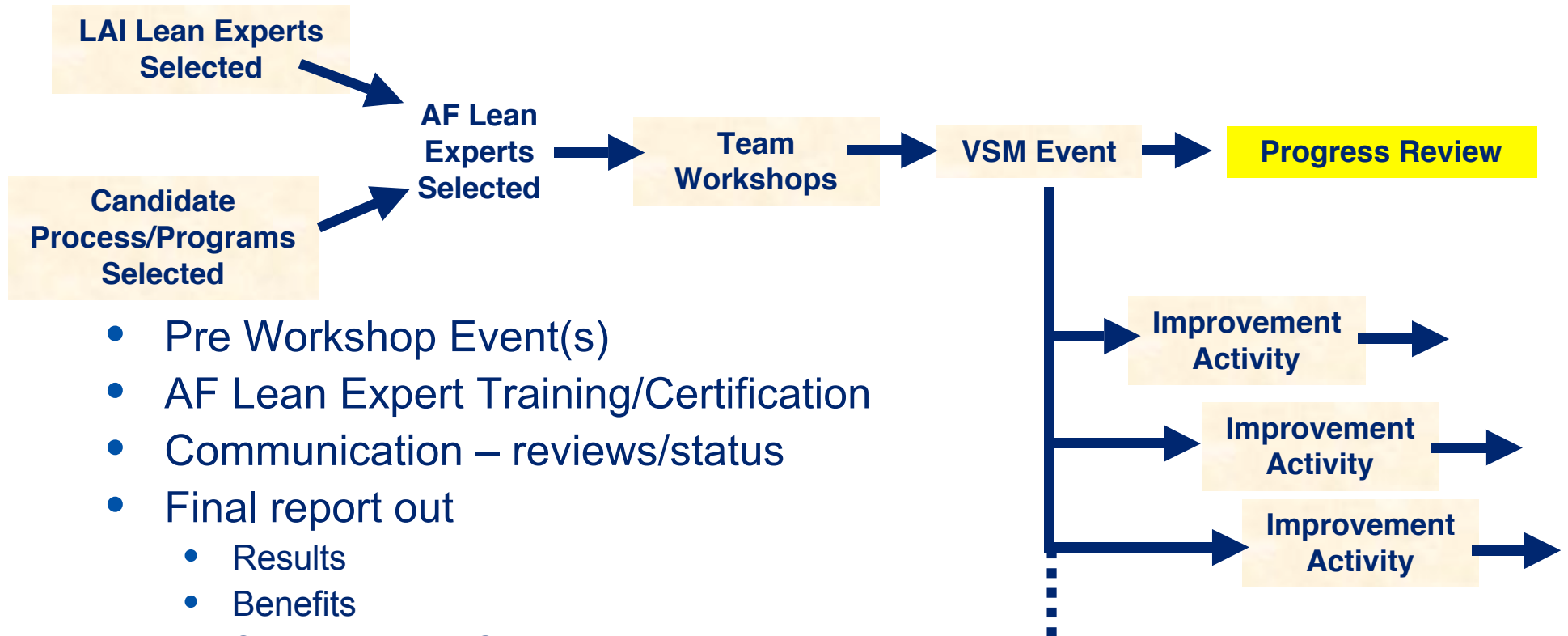


The LAI Lean Experts ... As of Nov 02

- Spiral 1 to focus on three projects/processes
- Four Lean Experts from industry on board
 - Boeing
 - Lockheed Martin
 - Northrop-Grumman
 - Raytheon
- Each Lean Expert is an experienced expert in transition and lean
- Committed to one year assignment with LAI Lean Now Change agent, mentor and trainer
- AF committed to providing four Lean Expert candidates
- Other LAI member companies stand ready to help



Initial Engagement Plan Based on F/A-22 Prototype



- Pre Workshop Event(s)
- AF Lean Expert Training/Certification
- Communication – reviews/status
- Final report out
 - Results
 - Benefits
 - Sustaining The Gain
- ID next project(s) for continuing improvement



Roles and Responsibilities LAI Lean Experts

- Coach/Sensei
- Facilitate
- Train/Certify
- Mentor
- Lean knowledge experts
- Feedback
 - To Air Force
 - To LAI
- Network across projects (Support system)
- Communicate
- Follow the process
- Establish certification criteria

Long Term Commitment to Lean Transformation



Roles and Responsibilities Air Force Lean Experts

- Become a Coach/Sensei
- Facilitate
- Become trained and certified
- Mentor projects as needed
- Become a lean knowledge expert
- Provide feedback to Air Force
 - To LAI
- Network across projects (support system)
- Train next wave of AF Lean Experts
- Become a change agent
- Communicate
- Follow the process

Long Term Commitment to Lean Transformation



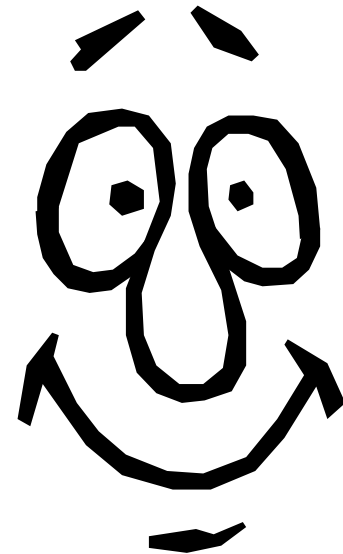
Air Force Prototype Team Lead

- Be a collaborative leader
- Communicate
 - Progress
 - Metrics
- RAA (Responsibility, Authority, Accountability)
- Assign and follow-up on action items
- Manage scope
- Be a team member (see other roles)
- Rely on Lean Experts for guidance



Prototype Team Members

- Plan and manage project
- Supply process expertise
- Collect process data
- Generate/supply improvement ideas
- Advocate change
- Be a team player
- Follow through with implementation
- Learn
- Become lean advocates
- Communicate
- Keep smiling and have fun!





LAI Overview



Lean Aerospace Initiative Consortium

- Airframe, engine, avionics, missile and space companies
- Air Force agencies and System Program Offices (C-17, F-22, JSF, Training)
- NASA, Army, Navy, NRO
- Pentagon - OSD, AF HQ
- International Association of Machinists
- MIT





The LAI Community

Avionics/Missiles

BAE Systems North America
Northrop Grumman ESSS
Raytheon Systems Co.
Raytheon Systems and Electronics Sector
Rockwell Collins, Inc.
Textron Systems Division

Space

Boeing Space & Communications
GenCorp Aerojet
Lockheed Martin Space & Strategic Missiles
Northrop Grumman ESSS Space Sector
Spectrum Astro
TRW Space and Electronics

Airframe

Boeing Military Aircraft & Missiles
Boeing Commercial Airplane Group
Boeing Phantom Works
Lockheed Martin Aeronautical Systems
Northrop Grumman ISS
Raytheon Aircraft Co.
Sikorsky

MIT

Center for Technology, Policy,
and Industrial Development
School of Engineering:
Aerospace
Mechanical
Sloan School of Management

Other Participants

IAM
AIA
DAU
IDA
International Collaborations:
Linköping University
Warwick, Bath, Cranfield
Nottingham Universities

Propulsion/Systems

Rolls Royce (North America)
Pratt & Whitney
Hamilton Sundstrand
Curtiss-Wright Flight Systems
Harris Government Comm.

US Air Force

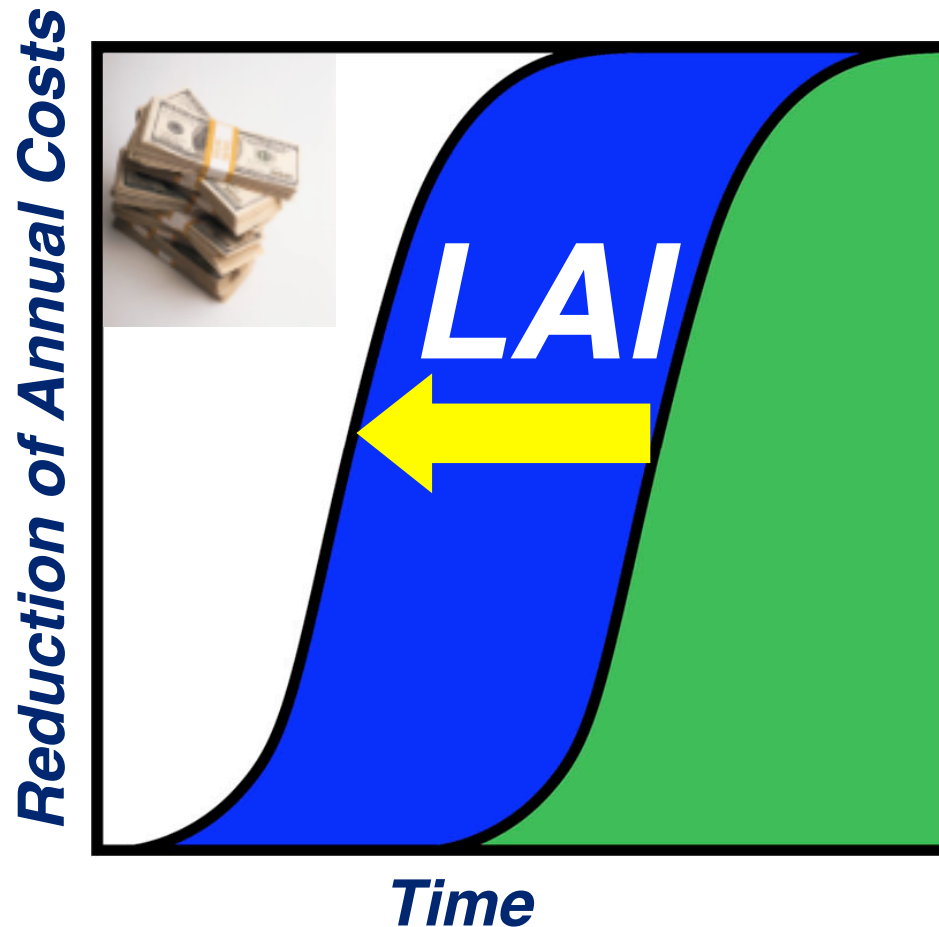
SAF/AQ
Aeronautical Systems Center
Air Force Research Laboratory
(Materials and Manufacturing Directorate)
Space and Missile Center
SPOs: JSF, F-22, C-17, Training (JPATS)

Other Government

DCMA
NASA
NAVAIR
AMCOM
OUSD(AT&L)
NRO



LAI Accelerates Transformation to Lean



Industry letter

“In effect, the LAI is responsible for taking years off our change-over from traditional to lean practices...”

Enterprise Value Phase Vision & Mission

Vision: U.S. aerospace enterprises reliably and efficiently creating value and rapidly adapting to change

Mission: Research, develop and promulgate practices, tools and knowledge to enable and accelerate the envisioned transformation of the greater US aerospace enterprise through people and processes





Key Stakeholder Value Expectations

Gen Lester Lyles, Commander, AFMC and LAI Co-Chair

- Get the word out; create and teach lean curriculum across the country
- “Kick it up a notch!”

Mrs. Darleen Druyun, Principal Deputy Assistant Secretary, SAF/AQ and LAI Co-Chair

- Lean promises and can deliver big improvements in productivity and efficiency
- Expand beyond the factory floor and into the rest of the organization, where the big costs are
- Lean must be driven into the supplier base
- Support Acquisition Center of Excellence



Enterprise Value Phase Goals

***Overarching Goal:* Accelerate the lean enterprise transformation of the U.S. aerospace enterprise**

***Overarching Metric:* Meeting LAI stakeholders' expectations**

Goal 1: Support the ongoing lean transformation of industry

Goal 2: Enable lean, value-creating supplier base

Goal 3: Support lean transformation of the government

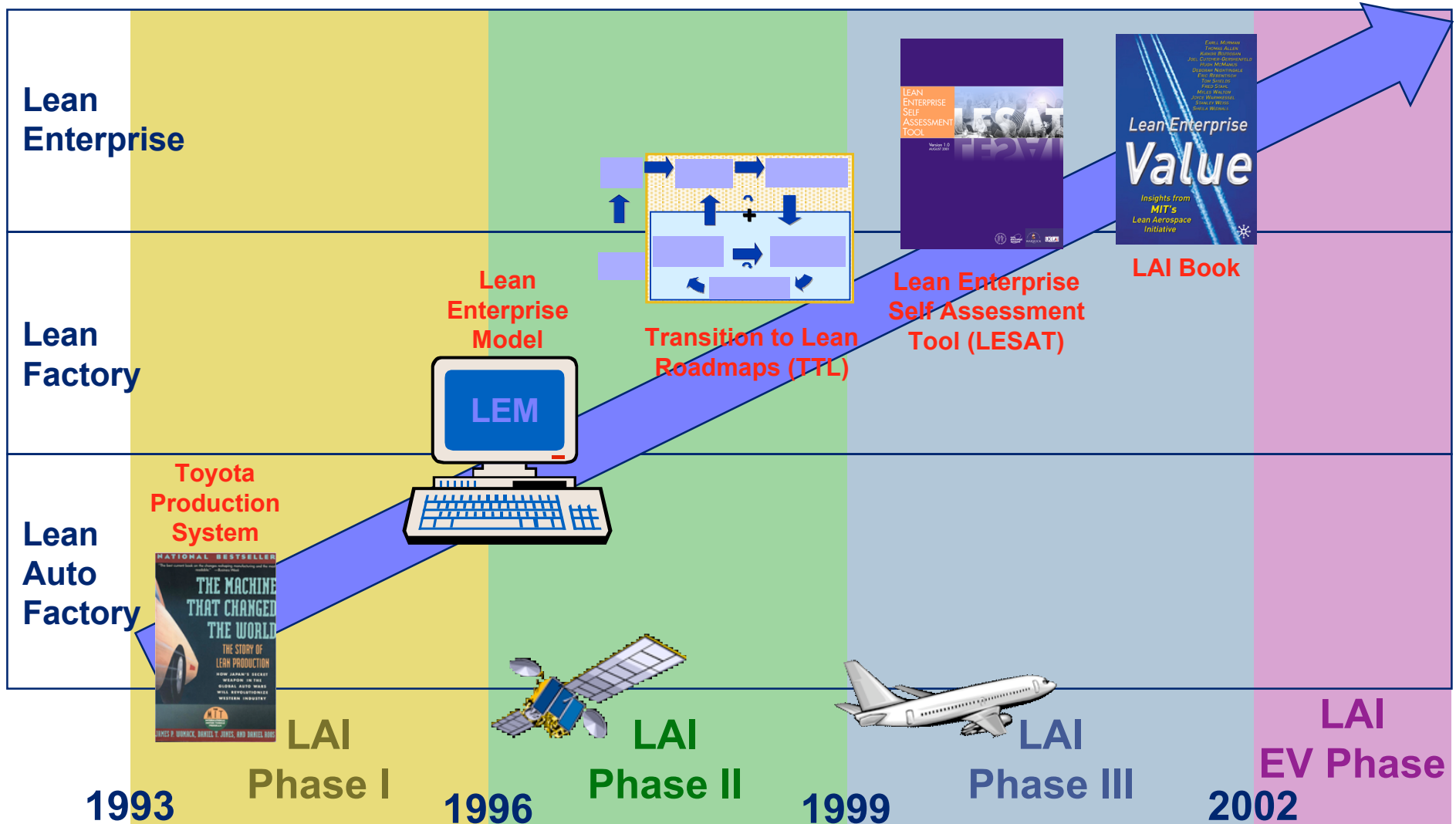
Goal 4: Educate and train stakeholders in value-creating lean principles and practices

Goal 5: Enhance the effectiveness of the national workforce

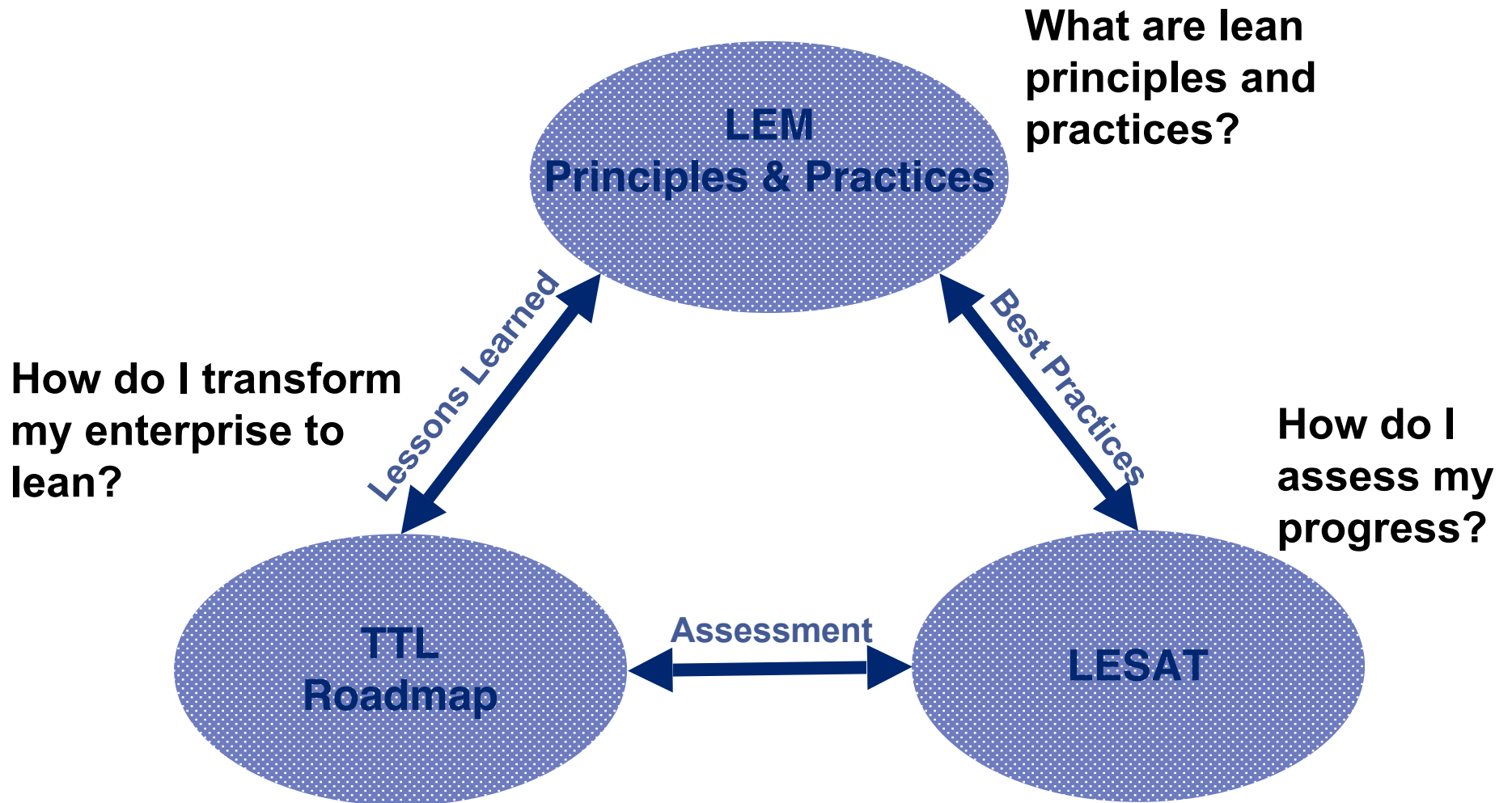
Goal 6: Support member implementation efforts by sustaining tools and knowledge base and by organizing outreach events



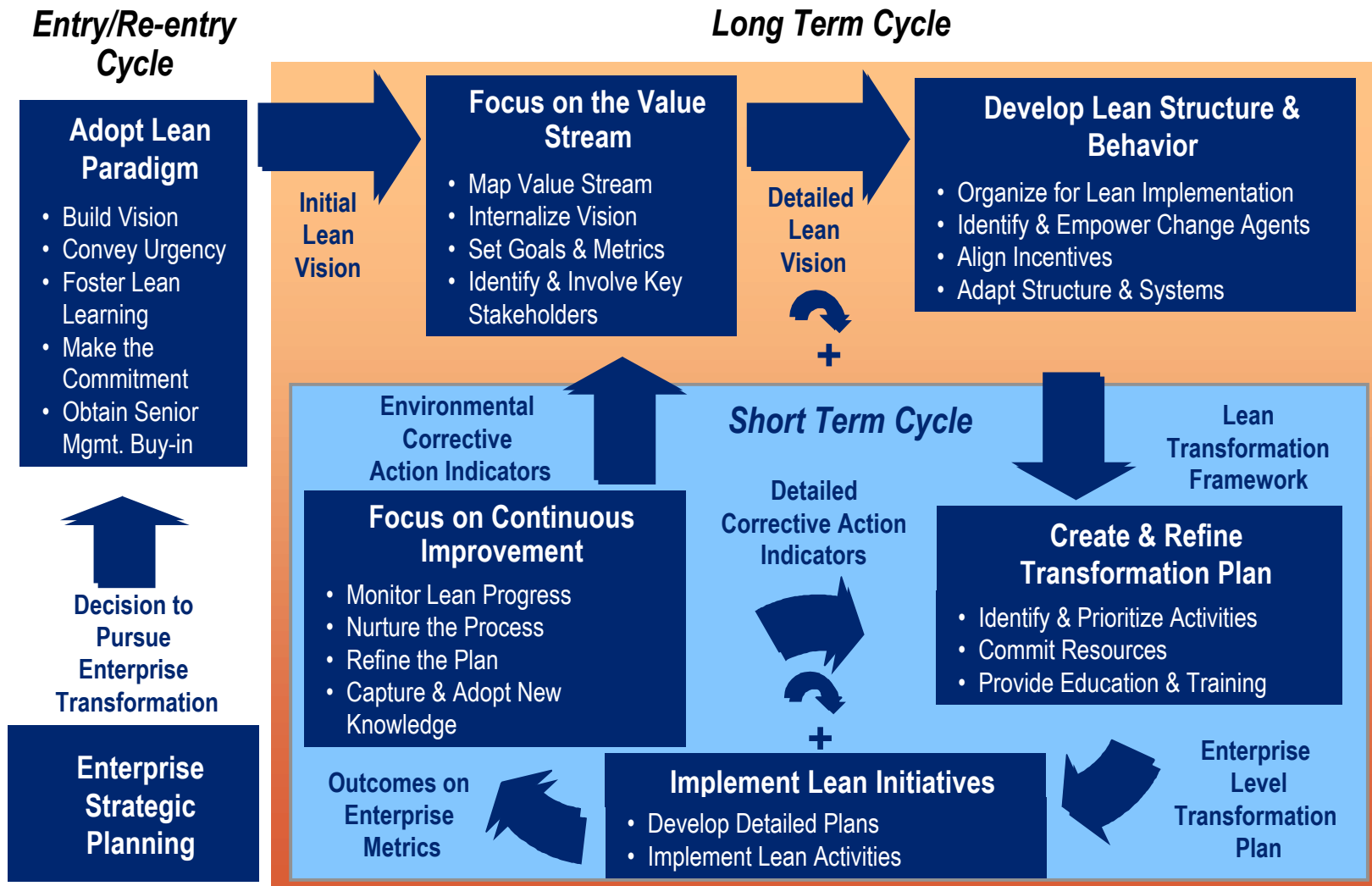
Lean Aerospace Journey And LAI Products



Lean Enterprise Toolset



Transition-To-Lean Roadmap





Evidence of Lean Potential in An Enterprise

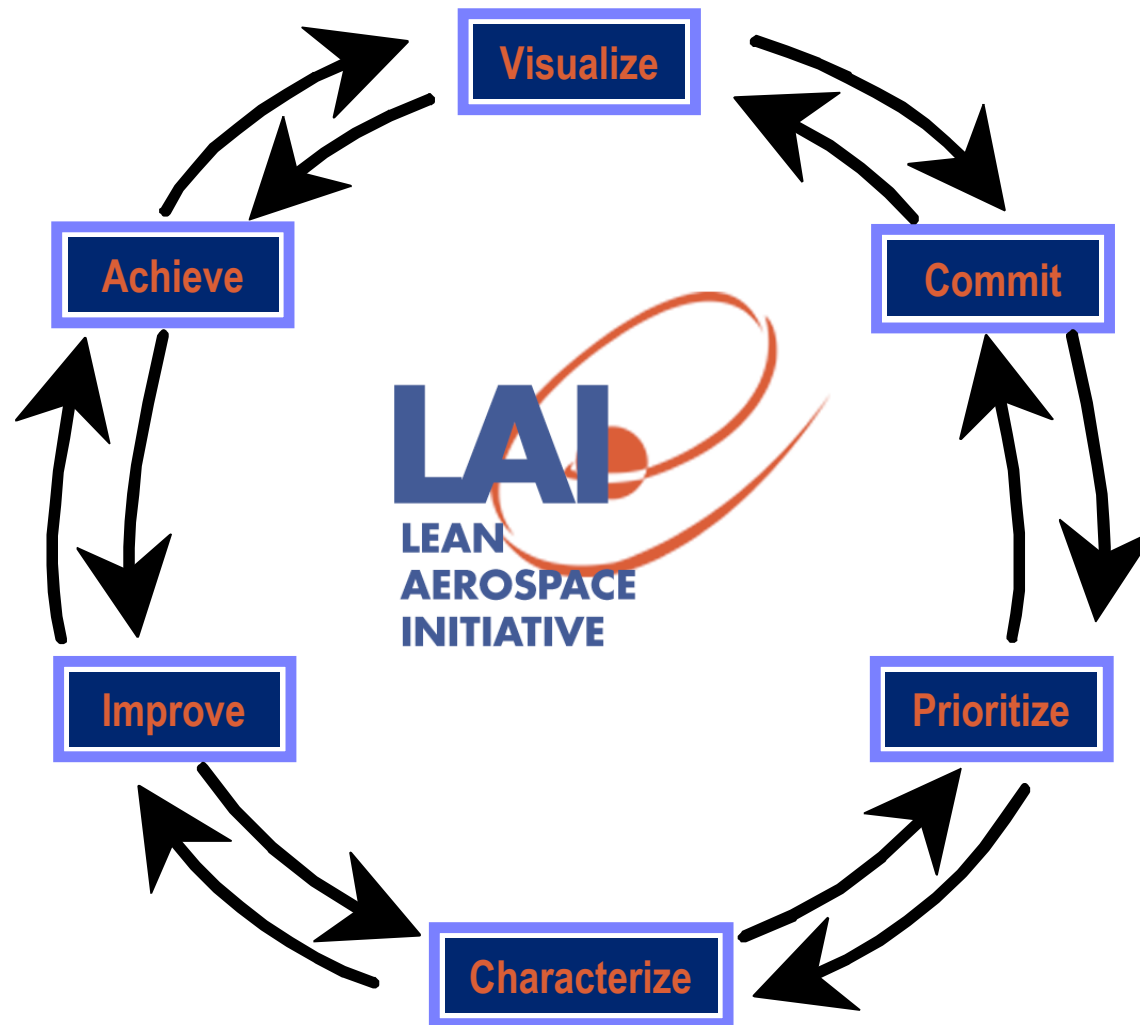
- F-16 maintained sales price and decreased order-to-delivery time by up to 42% while production rate decreased 75%
- C-17 unit priced decreased from \$260M to \$178 M for final 80 aircraft of 120 aircraft buy.
- Northrop Grumman ISS lean enterprise implementation reduced throughput times for major systems by 21 to 42%.
- F/A18-E/F EMD completed on time, within budget (without rebaseline) while meeting or exceeding performance requirements.
- Raytheon realized \$300M FY 2000 bottom line benefits from its enterprise wide Six Sigma program



Leading Transformation

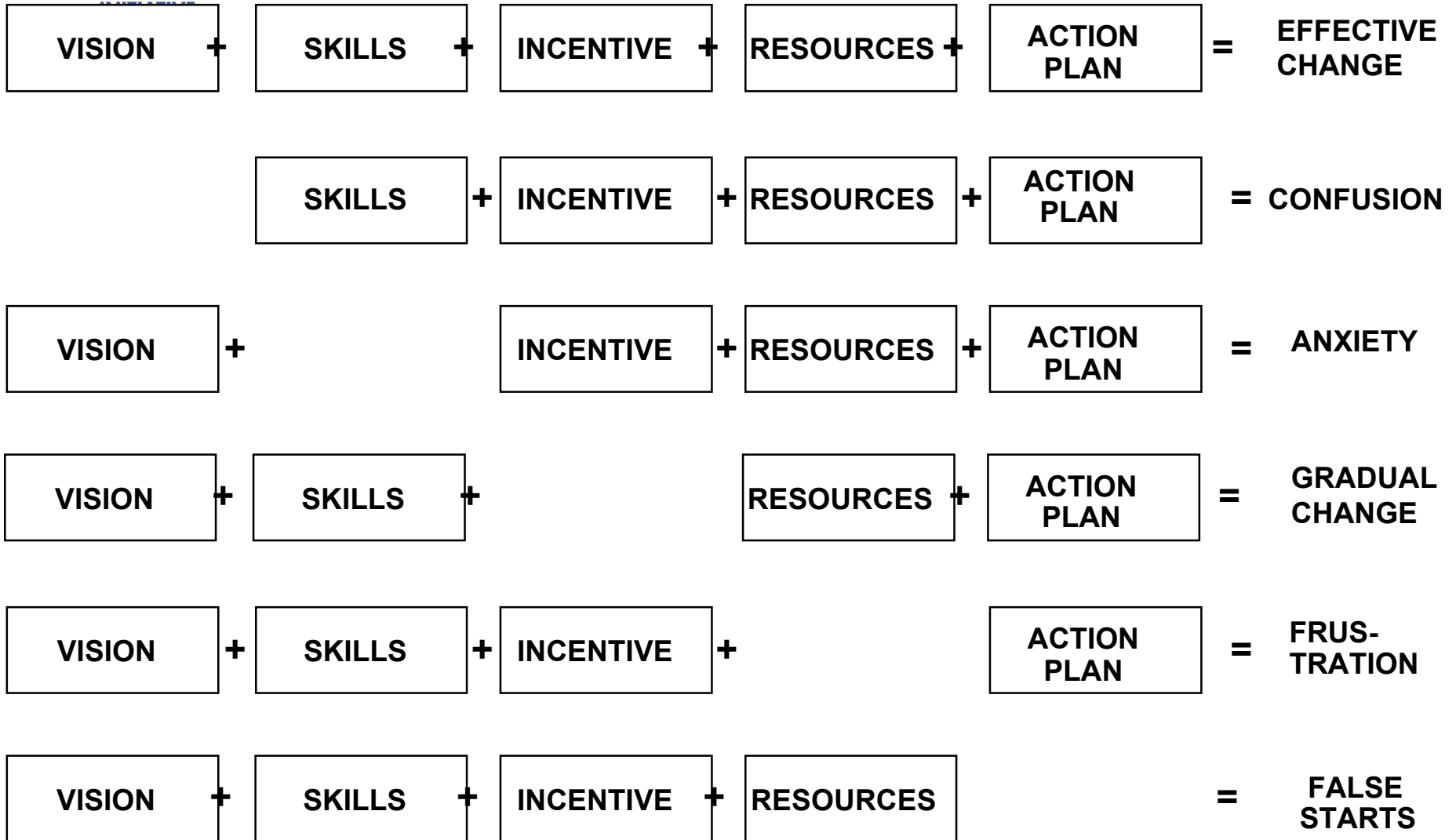


Continuous Improvement Process



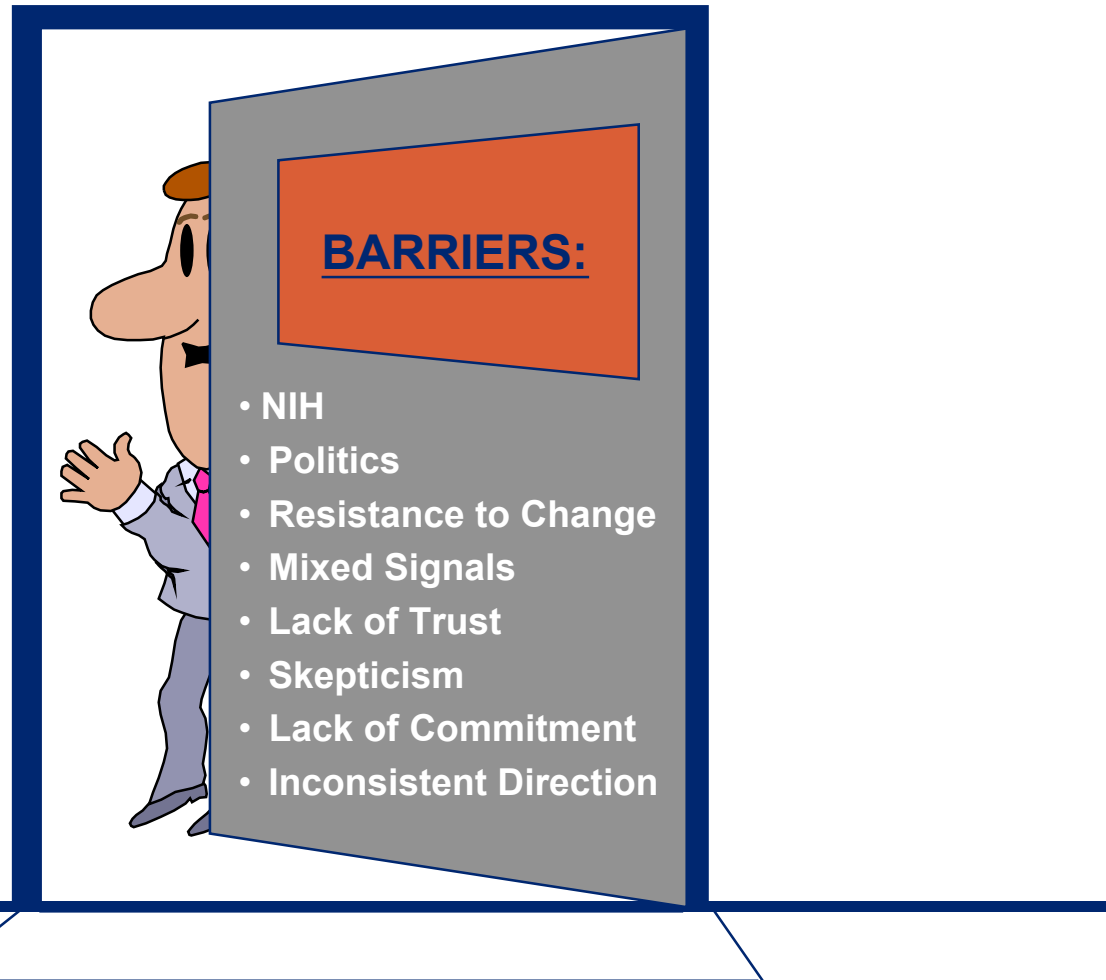


Managing Complex Change

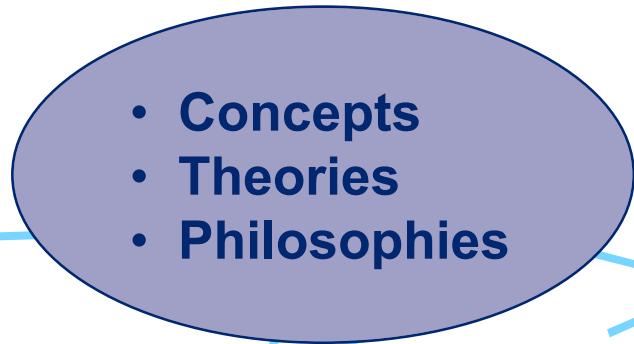


Things We Hide Behind

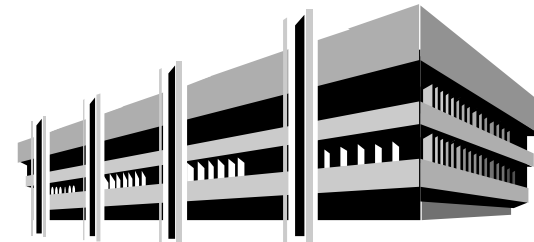
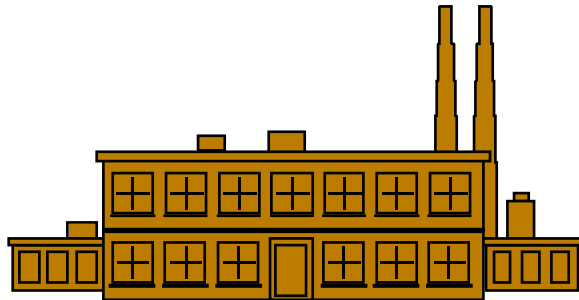
Culture



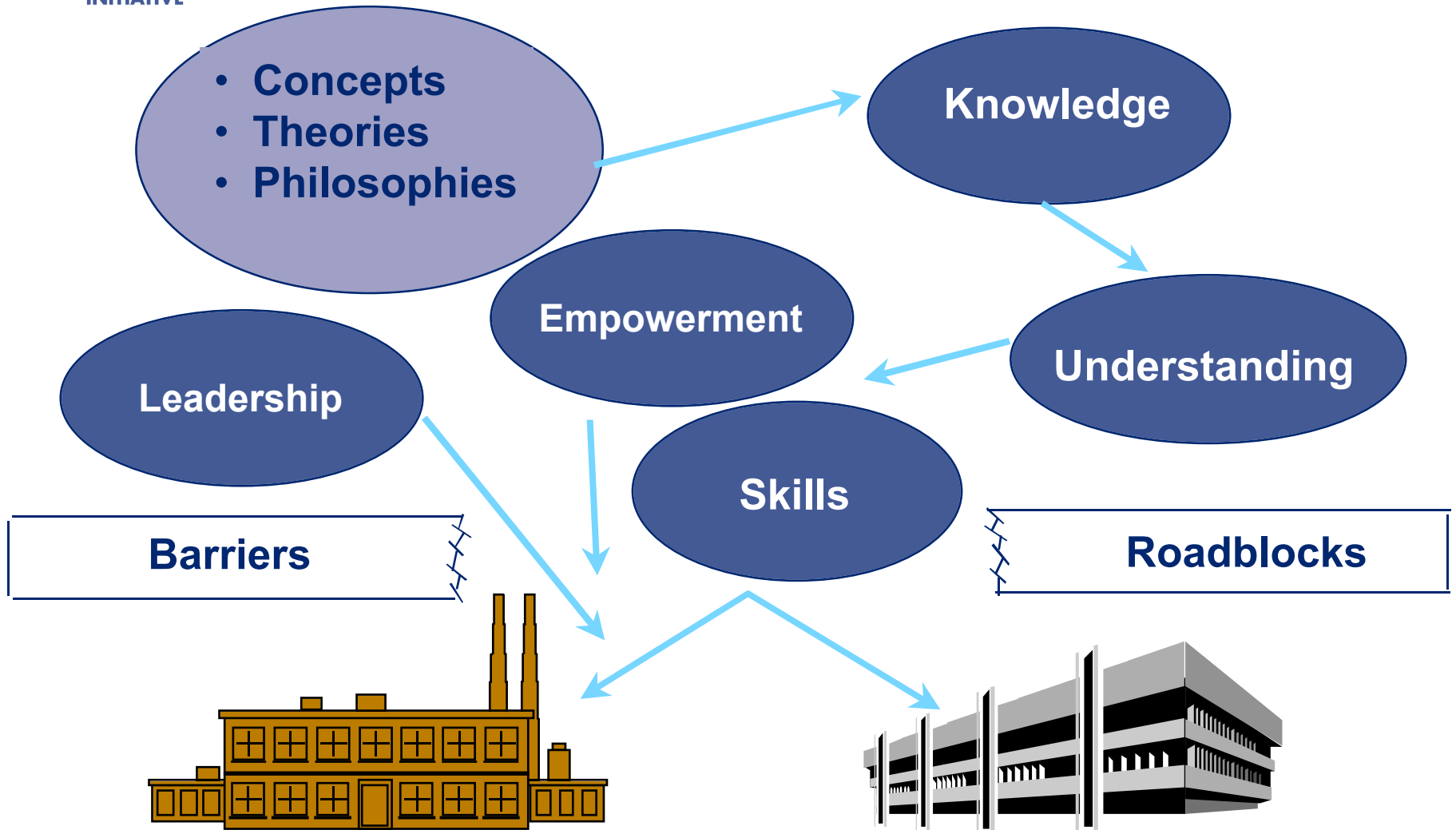
Barriers to Improvement



NIH	Politics	Resistance to Change	Mixed Signals	Lack of Trust	Skepticism	Lack of Commitment	Inconsistent Direction
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Breakthrough!



What Makes People Want to Change?

- Pain (burning platform)
- Despair (over long period of time)
- Discovery that change is possible





Which Organization is Likely to Lead the Way to the 21st Century?

Traditional

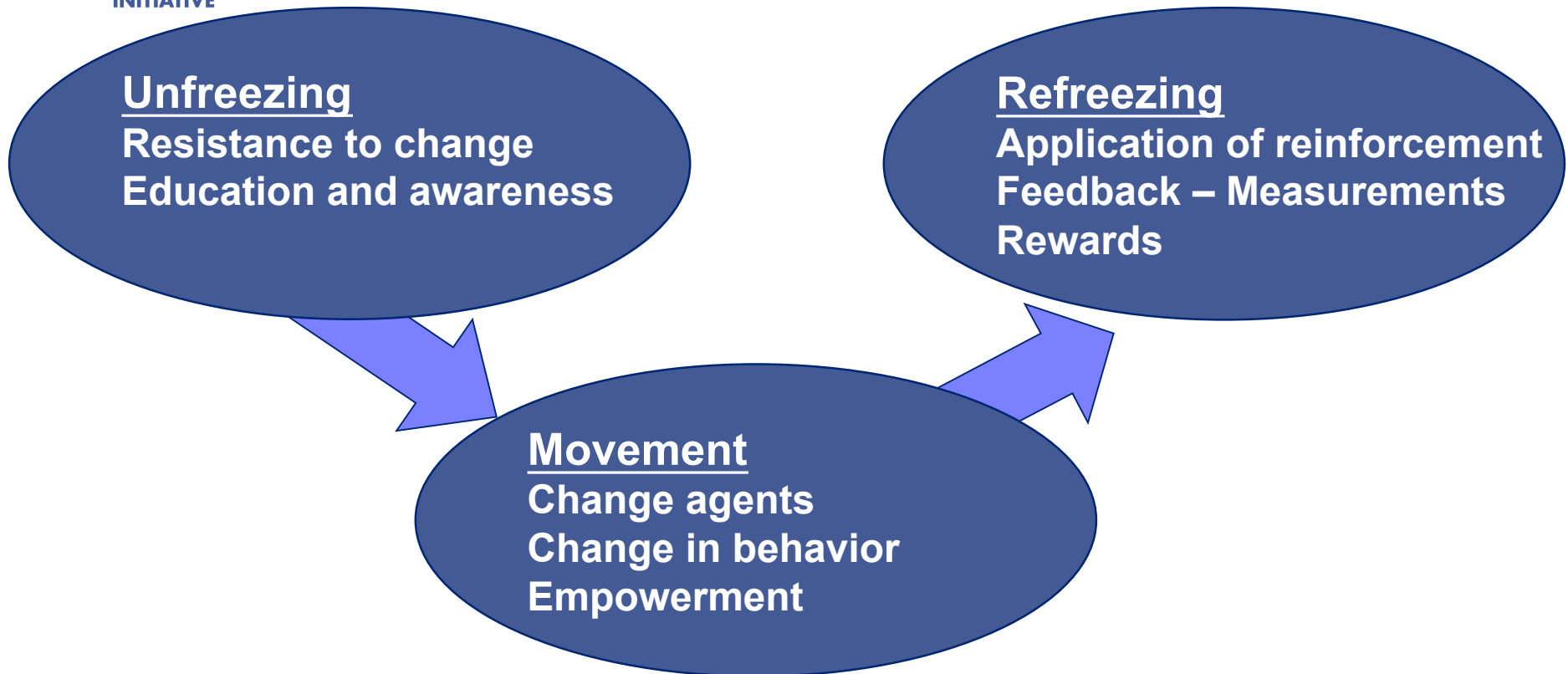
- Multiple reviews
- “Institutionalizes” waste
- Hierarchical approval
- Multiple processes & systems
- Sub-optimization
- “Push”

Lean

- Minimal meetings
- Focuses on “eliminating waste”
- Accountability
- Common processes & systems
- Business optimization
- “Pull”

Lean Is a Journey NOT an Event

What is Meaningful Change?



When the desired state is better than the existing state.

Meaningful change is the disruption of the status quo for a better state.



Elements of Success

All the elements to succeed are in place.....

- High and visible commitment
- Advanced information and focus
- Total involvement
- Process owners are the change agents
- Honest evaluations
- A good diagnosis (VSMs)
- Linked to mission and goals
- Professionalism

..... you are ready to succeed!

Take action, Lean Now!