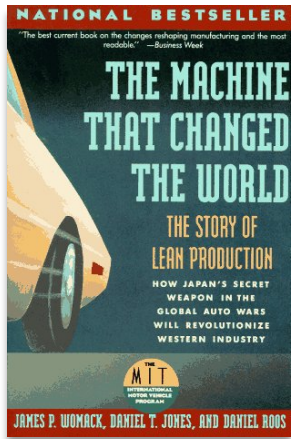




**LAI and Enterprise Excellence:  
Presented to Lean Flight Initiative 4  
Four Seasons Hotel, Atlanta, Georgia, US**

**C. Robert Kenley, Ph.D.  
Massachusetts Institute of Technology**

**May 11, 2011**



In 1990, an MIT Press book by Womack, Jones, and Roos on the automobile industry introduces **Lean Production** as a new industrial paradigm



U.S. AIR FORCE

In 1992 US Air Force asked: Can the concepts, principles and practices of the **Toyota Production System** be applied to the military aircraft industry?

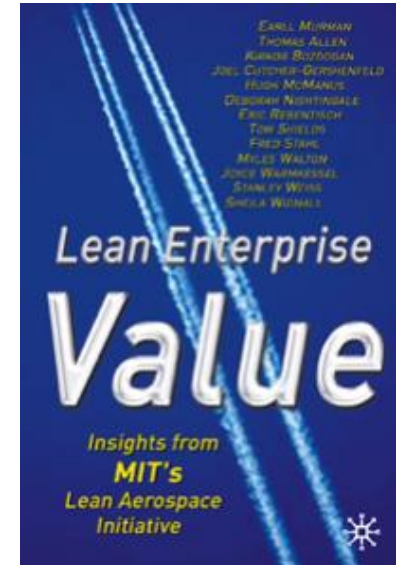
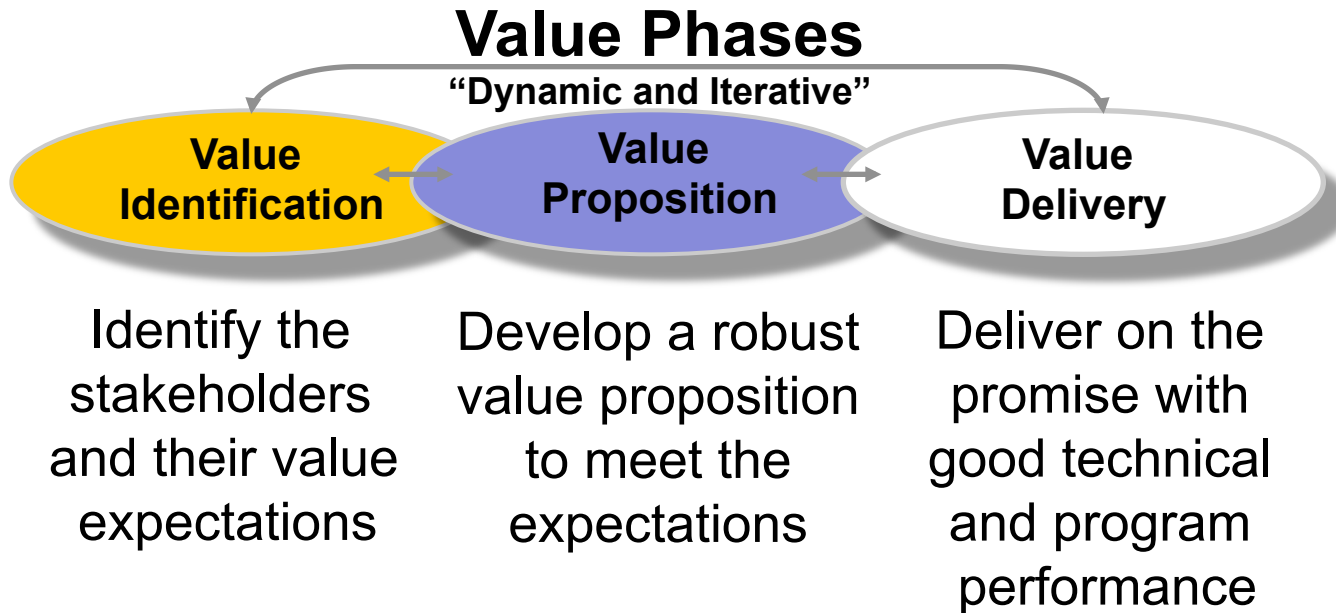


Massachusetts  
Institute of  
Technology

MIT wondered:

- Does Lean apply to an industry with significantly different products and customers?
- Will Lean principles and practices be extended beyond the Toyota Production System?

# First Major Publication by LAI on the Value Creation Framework



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

*“How various stakeholders find particular worth, utility, benefit, or reward in exchange for their respective contributions to the enterprise.”\**

# The Current LAI Vision and Mission Emphasizes Enterprise Excellence

## Vision

The Lean Advancement Initiative (LAI) at MIT enables enterprises to effectively, efficiently, and reliably create value in complex and rapidly changing environments.

## Mission

LAI enables the focused and accelerated transformation of complex enterprises through collaborative stakeholder engagement in developing and institutionalizing principles, processes, behaviors, and tools for enterprise excellence.

## Is this your story?

**E. gave me a call this morning .... They are currently going through a change to their management structure.... he DEFINITELY sees the value of doing an enterprise transformation .... He talked about feeling like he is over a “holding company of 15 silos” (that’s his 15 departments).**

**When he was doing “local lean” as head of the ED, he would see an improvement, but then would notice that it would not be aligned with the rest of the enterprise. Now as Interim President, he sees this problem “magnified.”**

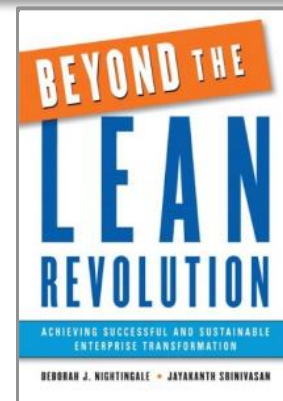
**Conversation with a healthcare executive in May 2011**

# Enterprise Excellence Defined

An **enterprise** is  
“a complex, integrated, and  
interdependent system of  
people, processes, and  
technology that **creates value**  
as determined by its key  
stakeholders.

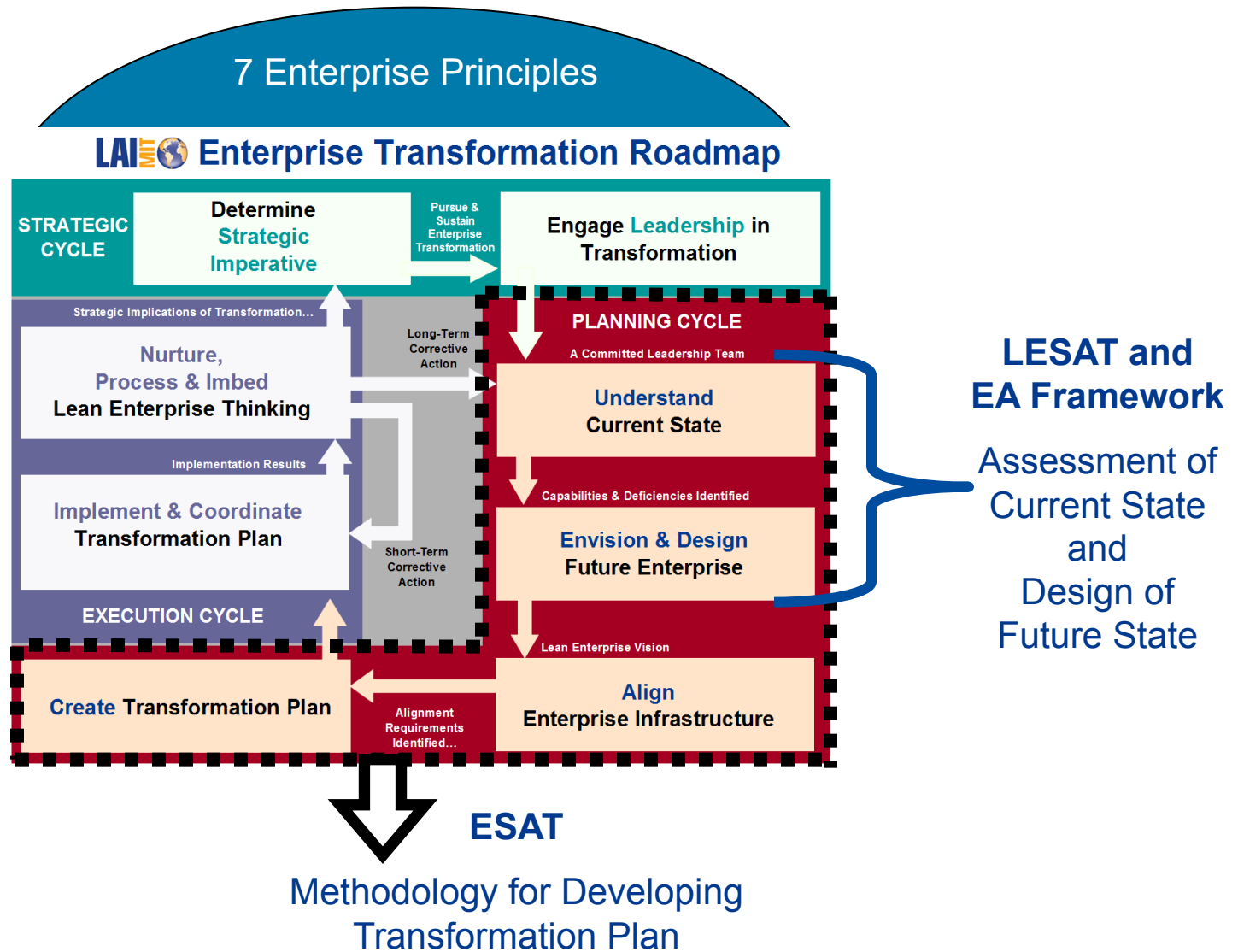
An enterprise typically  
consists of **multiple**  
**organizations** (e.g., suppliers,  
partners, regulators) rather  
than a single corporation,  
division, or government unit.”

An enterprise has achieved  
**excellence** when “it effectively,  
efficiently, and reliably creates  
**sustained value** as determined  
by its key stakeholders  
(including comparisons with  
relevant benchmarks)  
over time and changing  
circumstances.”



Amacon Press –Release: Aug. 2011

# Enterprise Transformation Framework



# 7 Principles of Lean Enterprise Transformation

**1.**

Adopt a **holistic approach** to enterprise transformation.

**2.**

Secure **leadership commitment** to drive and institutionalize enterprise behaviors.

**3.**

Identify relevant **stakeholders** and determine their **value propositions**.

**4.**

Focus on enterprise **effectiveness before efficiency**.

**5.**

Address **internal and external** enterprise interdependencies.

**6.**

Ensure **stability and flow** within and across the enterprise.

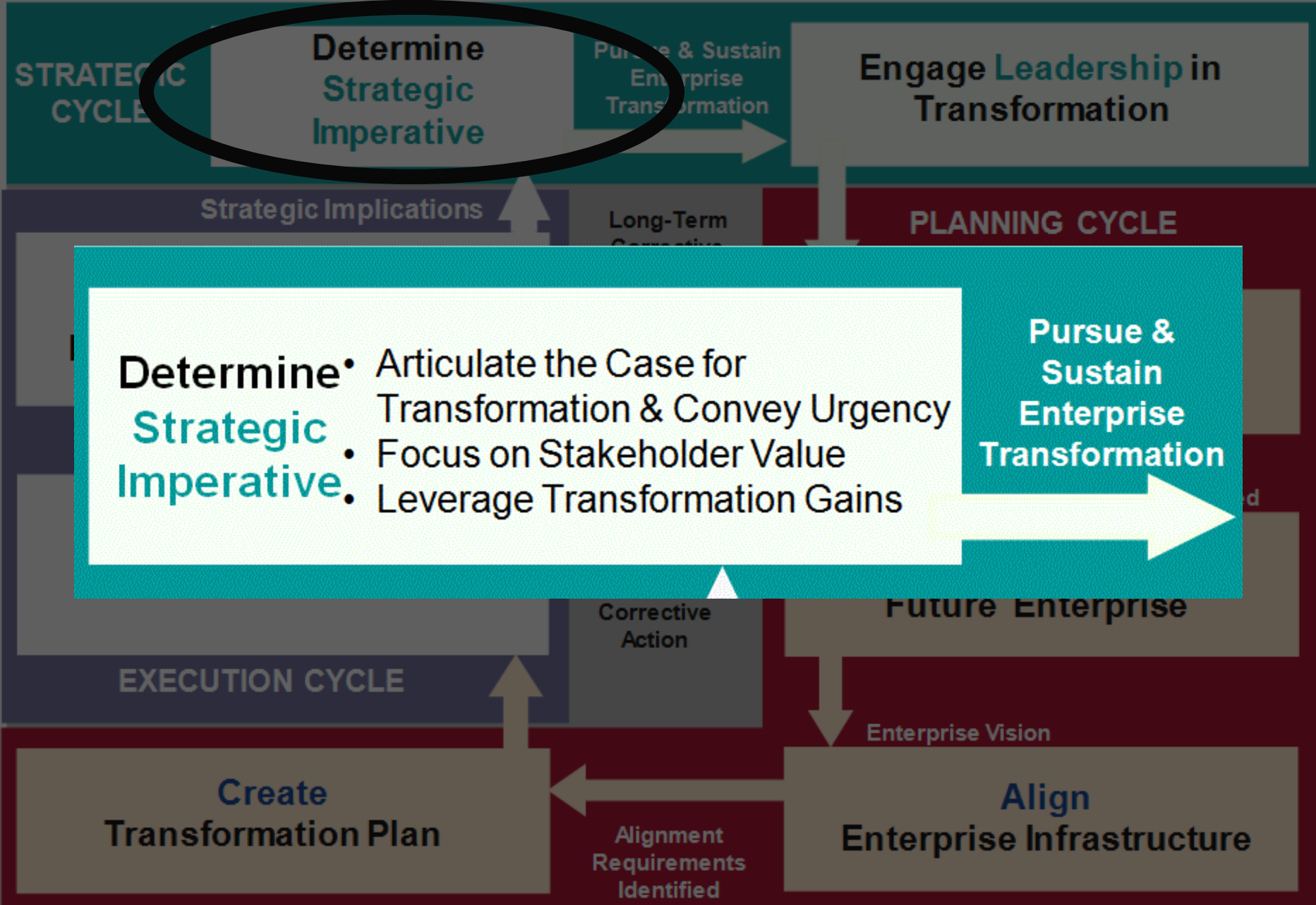
**7.**

Emphasize **organizational learning**.

Source: D. Nightingale and J. Srinivasan, MIT 2010



# LAI Enterprise Transformation Roadmap



# PTSD: A Significant Pathology of War A Major Concern Being Addressed by LAI

5% to 20% prevalence

Over \$2 Billion  
Invested

Over 125 psychological  
health programs

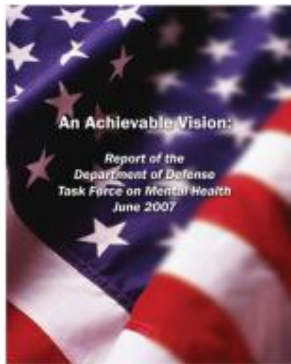
- Challenges with Access to and Quality of Care
- Challenges with Culture and Stigma
- Consideration of Families



Resources: RAND, 2008 Invisible Wounds of War

# Psychological Health is an Enterprise Challenge

*“The current system is insufficient to meet the needs of today’s forces and their beneficiaries and will not be sufficient to meet the needs of the future.”*



- DoD Task Force on Mental Health, 2007



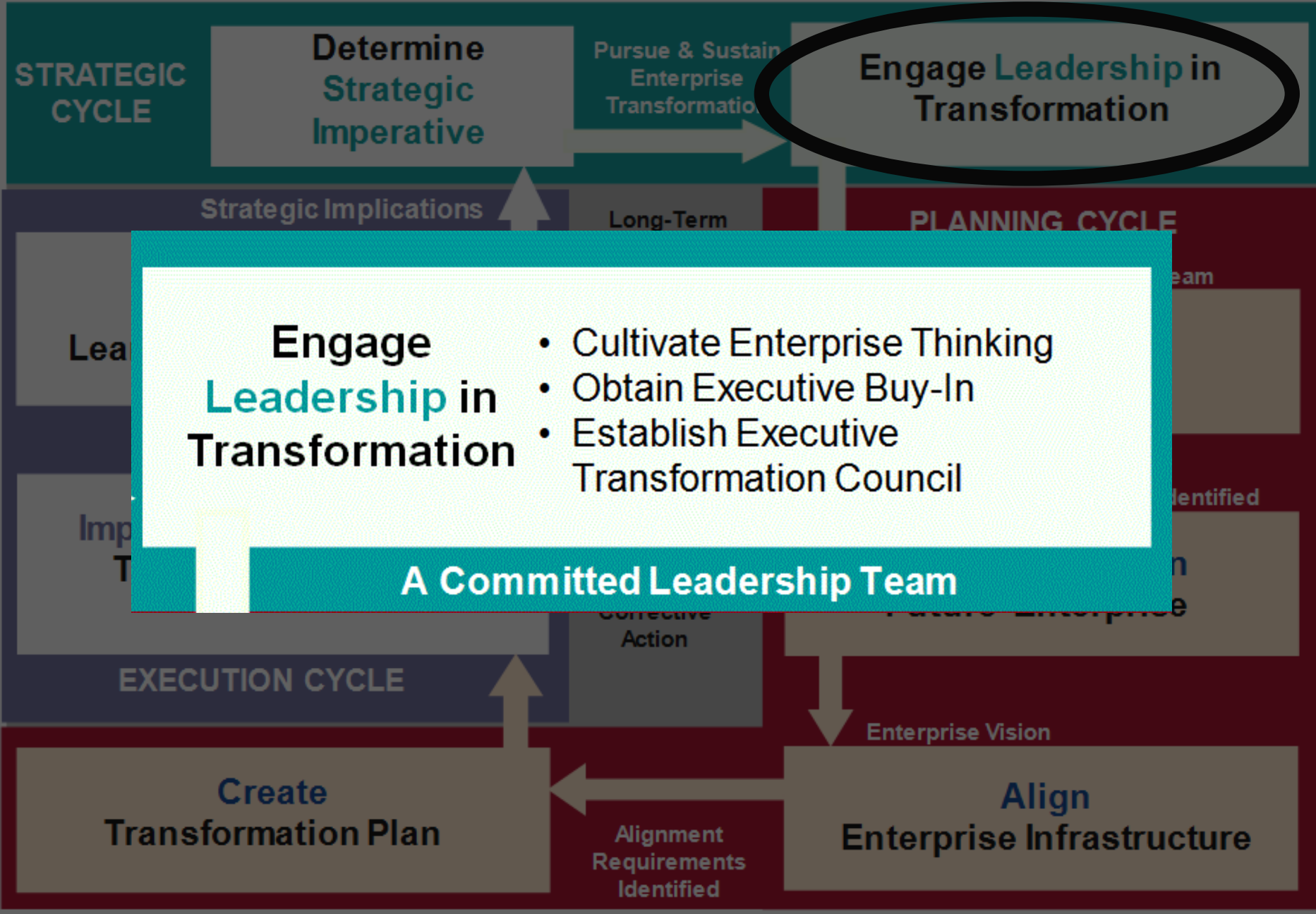
## **4-Star Speaks Out on Struggle with PTSD**

*“This isn’t just a debt of gratitude. This is a debt that must be repaid because they have sacrificed so much. They have done exactly what this country has asked. They have fought and suffered and their lives have been affected forever.”*



**Admiral Michael Mullen,**  
*Chairman of the  
Joint Chiefs of Staff*  
*Army Times, 11-26-2008*

# LAI Enterprise Transformation Roadmap



# Engage Senior Leadership

## NAVY



**Admiral Jonathan Greenert**,  
Vice-Chief of Naval Operations  
*and*  
**VADM Adam Robinson**,  
Navy Surgeon General



**Admiral Mike Mullen**,  
Chairman of the  
Joint Chiefs of Staff

## AIR FORCE



**General Howie Chandler**,  
Vice Chief of U.S. Air Force  
*and*  
**LT. General Bruce Green**,  
Air Force Surgeon General

## ARMY



**General Peter Chiarelli**,  
Vice-Chief of U.S. Army  
*and*  
**VADM Adam Robinson**,  
Army Surgeon General

## ADVISORS



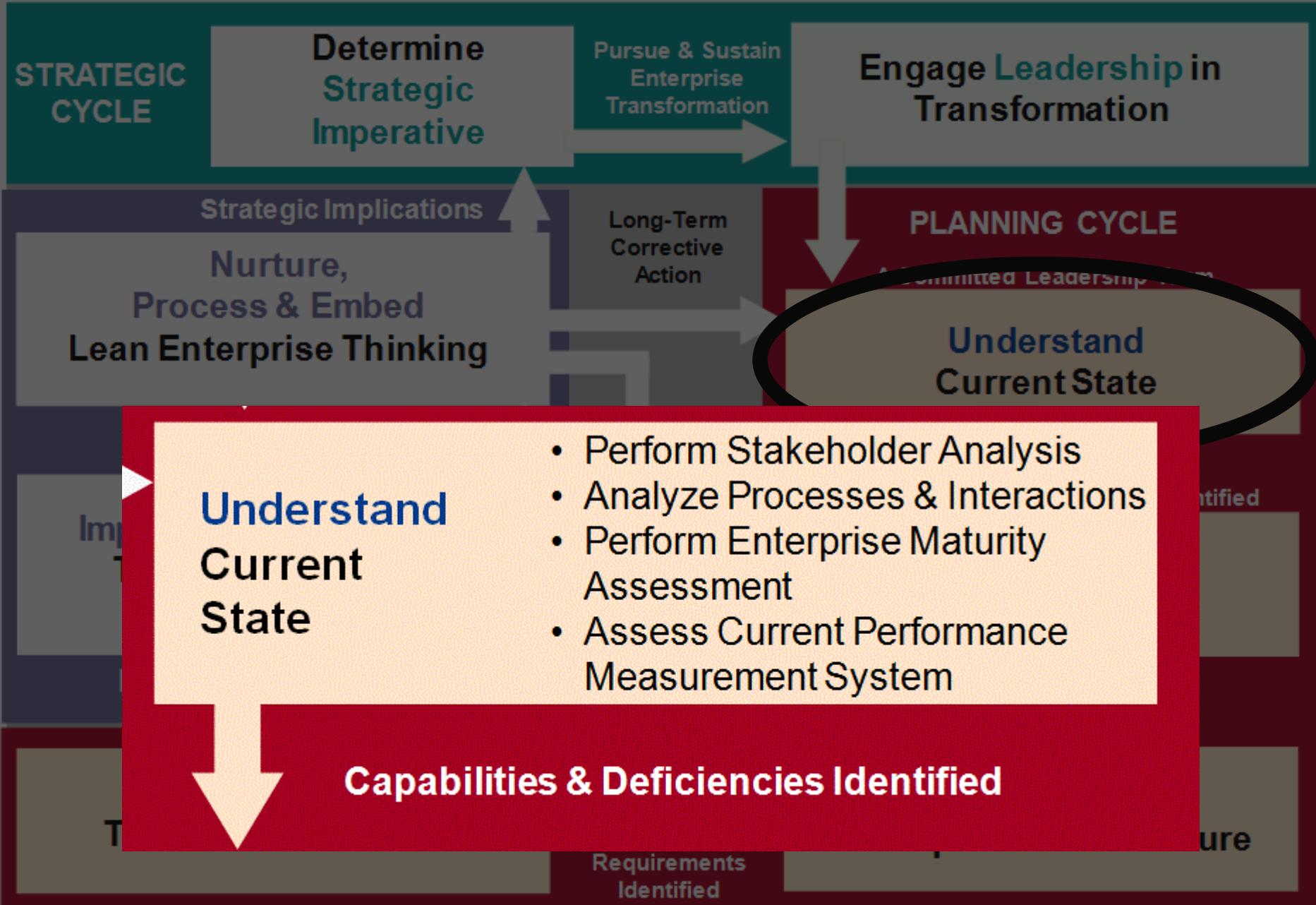
**Dr. James B. Peake**, Lt. Gen.(ret),  
Former Secretary of Veterans Affairs  
*and*  
**Honorable Togo West**,  
Former Secretary of the Army

## MARINE CORPS



**General James Amos**,  
Assistant Commandant  
of the Marine Corps

# LAI Enterprise Transformation Roadmap

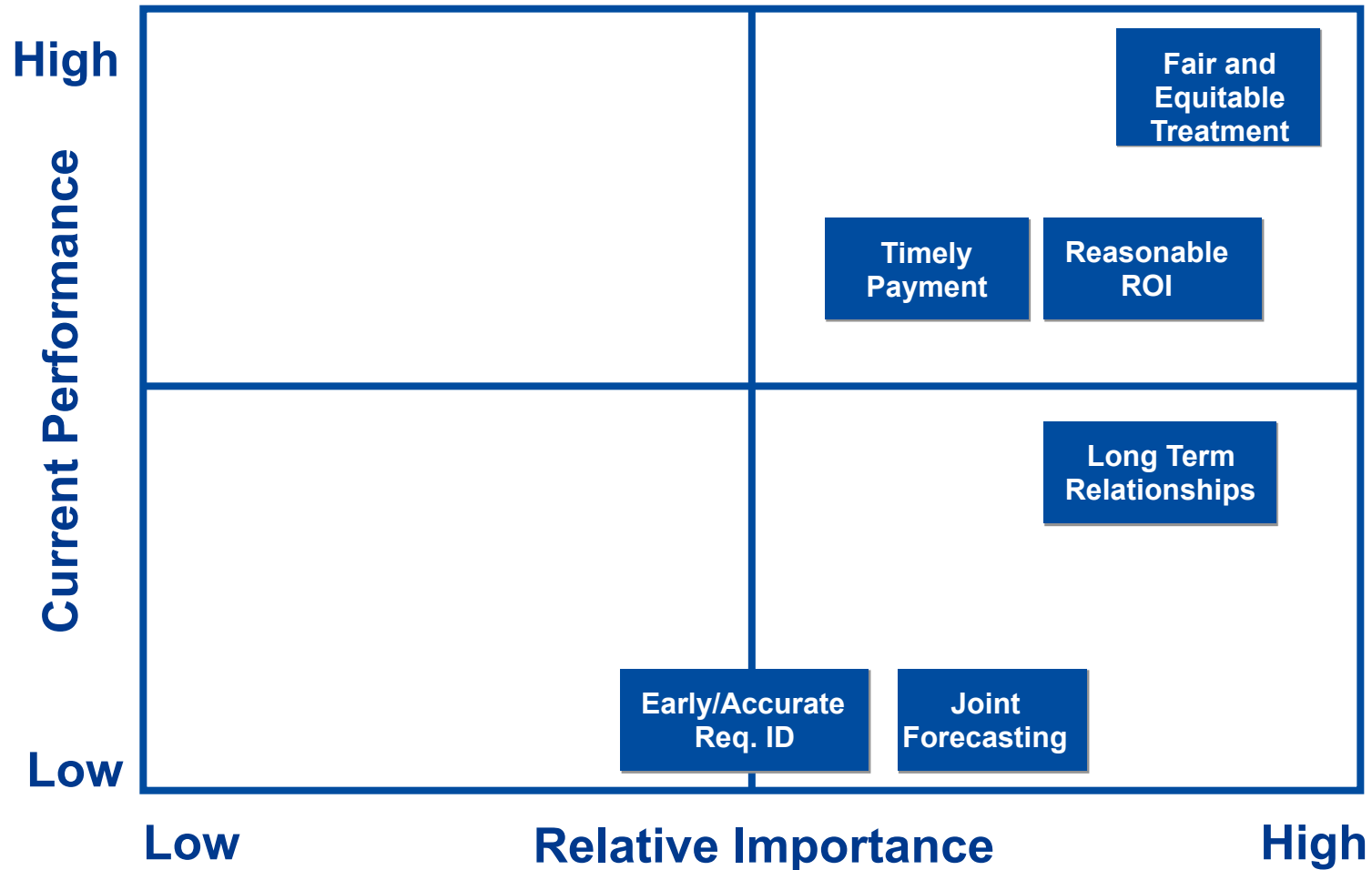


## Understand Current State

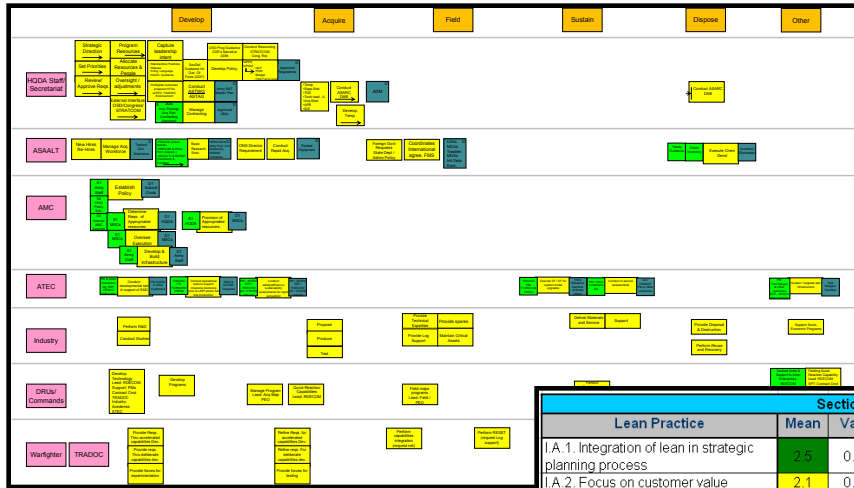
- Perform Stakeholder Analysis
- Analyze Processes & Interactions
- Perform Enterprise Maturity Assessment
- Assess Current Performance Measurement System

**Capabilities & Deficiencies Identified**

# Stakeholder: Supplier



# Measure and Analyze the Current Operating Model



- ✓ Identify the Enterprise Core Value and Map Critical Processes
- ✓ Analyze the Critical Processes for Waste, Opportunities and Gaps  
*(Analysis Tools will Vary – depending on the Application)*

✓ **LESAT Tool Measures the Effectiveness and Lean Maturity of the Enterprise**

| Section I - Lean Transformation / Leadership                  |      |      |       |    |    |    |    |    |     |     |     |     |  |
|---|------|------|-------|----|----|----|----|----|-----|-----|-----|-----|--|
| Lean Practice   | Mean | Var. | Range | L1 | L2 | L3 | L4 | L5 | D1  | G1  | D2  | G2  |  |
| IA.1. Integration of lean in strategic planning process       | 2.5  | 0.4  | 2.0   | 0  | 11 | 8  | 1  | 0  | 4.1 | 1.5 | 4.9 | 1.9 |  |
| IA.2. Focus on customer value                                 | 2.1  | 0.7  | 3.0   | 5  | 9  | 5  | 1  | 0  | 3.5 | 1.4 | 4.2 | 2.2 |  |
| IA.3. Leveraging the extended enterprise                      | 2.4  | 0.6  | 2.0   | 3  | 7  | 10 | 0  | 0  | 3.8 | 1.5 | 4.7 | 2.3 |  |
| IB.1. Learning and education in 'lean' for enterprise leaders | 2.4  | 0.6  | 3.0   | 2  | 9  | 8  | 1  | 0  | 3.8 | 1.4 | 4.7 | 2.3 |  |
| IB.2. Senior management commitment                            | 1.4  | 0.6  | 3.0   | 14 | 5  | 0  | 1  | 0  | 3.4 | 2   | 4.4 | 3.1 |  |
| IB.3. Lean Enterprise Vision                                  | 1.6  | 0.7  | 2.0   | 12 | 4  | 4  | 0  | 0  | 3.4 | 1.9 | 4.6 | 2.9 |  |
| IB.4. A sense of urgency                                      | 1.9  | 0.7  | 3.0   | 7  |    |    |    |    |     |     |     |     |  |
| IC.1. Understanding the current value stream                  | 1.7  | 0.6  | 2.0   | 10 |    |    |    |    |     |     |     |     |  |
| IC.2. Enterprise flow   | 1.7  | 0.5  | 2.0   | 9  |    |    |    |    |     |     |     |     |  |
| IC.3. Designing the future value stream                       | 1.2  | 0.3  | 2.0   | 17 |    |    |    |    |     |     |     |     |  |
| IC.4. Performance measures                                    | 1.4  | 0.5  | 2.0   | 15 |    |    |    |    |     |     |     |     |  |
| ID.1. Enterprise organisational orientation                   | 2.1  | 0.6  | 3.0   | 4  |    |    |    |    |     |     |     |     |  |
| ID.2. Relationships based on mutual trust                     | 1.9  | 0.6  | 2.0   | 7  |    |    |    |    |     |     |     |     |  |
| ID.3. Open and timely communications                          | 2.1  | 0.5  | 3.0   | 3  |    |    |    |    |     |     |     |     |  |

|   |   | 1 2 3 1 3 4 3 3 2 0 2   |                  |                     |  |                               |                   |                   |            |                              |                 |   |   |                          |   |
|---|---|-------------------------|------------------|---------------------|--|-------------------------------|-------------------|-------------------|------------|------------------------------|-----------------|---|---|--------------------------|---|
|   |   | 1 0 2 1 0 0 0 1 1 2 4 0 |                  |                     |  |                               |                   |                   |            |                              |                 |   |   |                          |   |
|   |   | 2 2 4 4 1 3 4 4 4 4 4 2 |                  |                     |  |                               |                   |                   |            |                              |                 |   |   |                          |   |
| 8 | 2 | 10                      |                  |                     |  |                               |                   |                   |            |                              |                 |   |   |                          | Increase capability to generate trained, ready forces to meet ARFORGEN requirements                     |
|   | 7 | 2                       | 9                |                     |  |                               |                   |                   |            |                              |                 |   |   |                          | Improve execution of sustainment and reset functions  |
|   | 5 | 4                       | 9                |                     |  |                               |                   |                   |            |                              |                 |   |   |                          | Provide greater transparency and visibility of accurate data and information to enhance decision making |
|   | 0 | 2                       | 2                |                     |  |                               |                   |                   |            |                              |                 |   |   |                          | Maintain a trained and ready military and civilian workforce  |
|   | 6 | 2                       | 8                |                     |  |                               |                   |                   |            |                              |                 |   |   |                          | Establish an "enterprise focused culture" which embraces the principles of CPI                          |
|   |   |                         |                  |                     |  |                               |                   |                   |            |                              |                 |   |   |                          |   |
|   |   |                         | Reset Cycle Time | Equipment Readiness | Defense Acquisition Executive Summary (DAES) | Earned Value Management (EVM) | Contract Closeout | Order Fulfillment | Production | % AWF on glide path for CLPs | % AWF certified | % LINS fully equipped during ARFORGEN cycle | Alignment of programs with user requirement | Technology Transfer Rate | Strategic Objectives  |
|   |   |                         | Metrics          |                     |  |                               |                   |                   |            |                              |                 |   |   |                          | Stakeholder Values  |
|   |   |                         | Key Processes    |                     |  |                               |                   |                   |            |                              |                 |   |   |                          |   |

✓ **X-Matrix is used to validate / identify gaps between Strategy, Value Delivered, Processes, and Metrics**



# LAI Enterprise Transformation Roadmap

## Envision & Design Future Enterprise

- Create Vision of Future State
- Perform Gap Analysis Between Current and Future States
- Architect "To-Be" Enterprise

**Enterprise Vision**

## Envision & Design Future Enterprise

Enterprise Vision

**Align Enterprise Infrastructure**

Alignment Requirements Identified

**Create Transformation Plan**

EXECUTION CYCLE

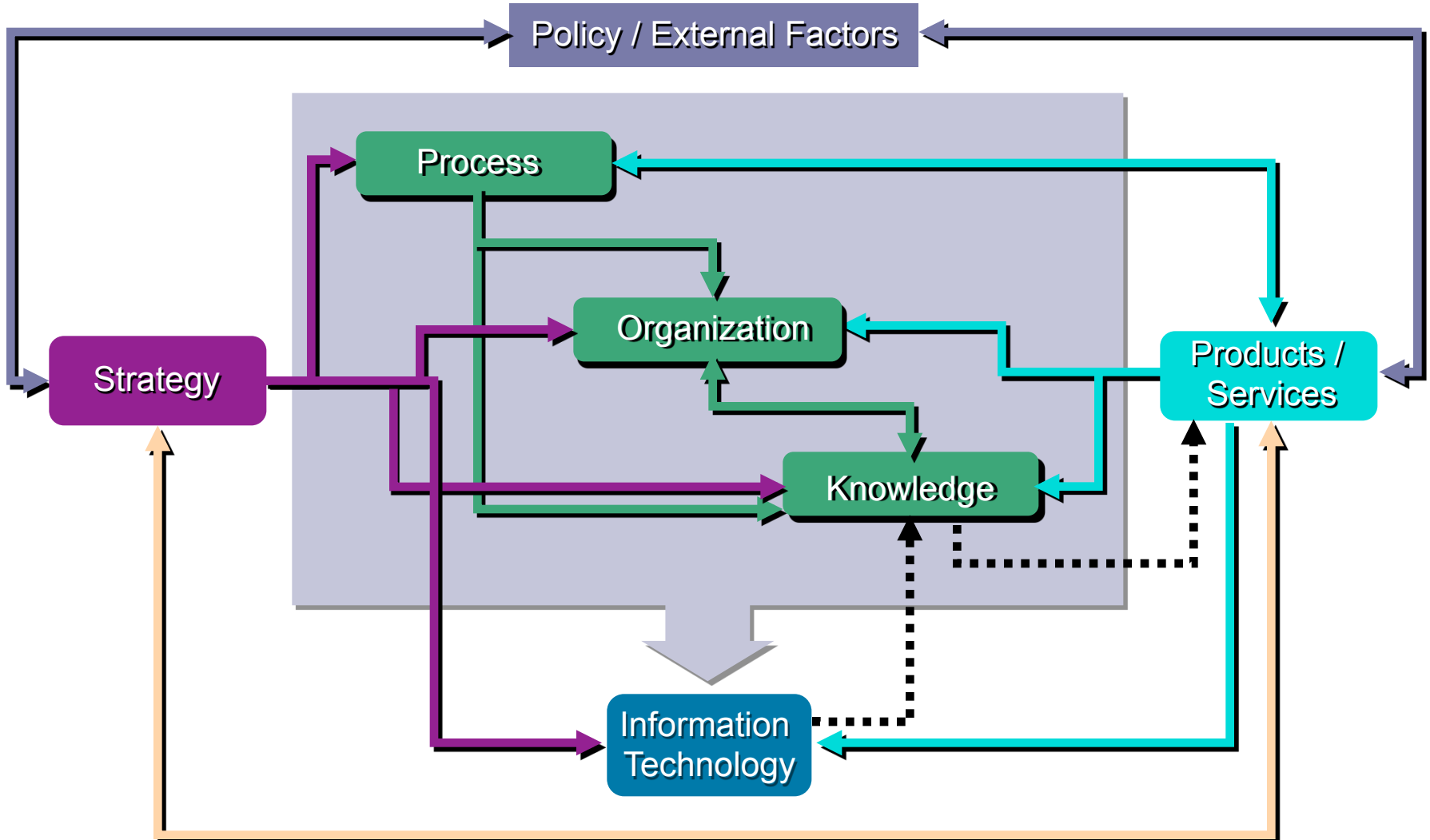
**Implement & Coordinate Transformation Plan**

Short-Term Corrective Action

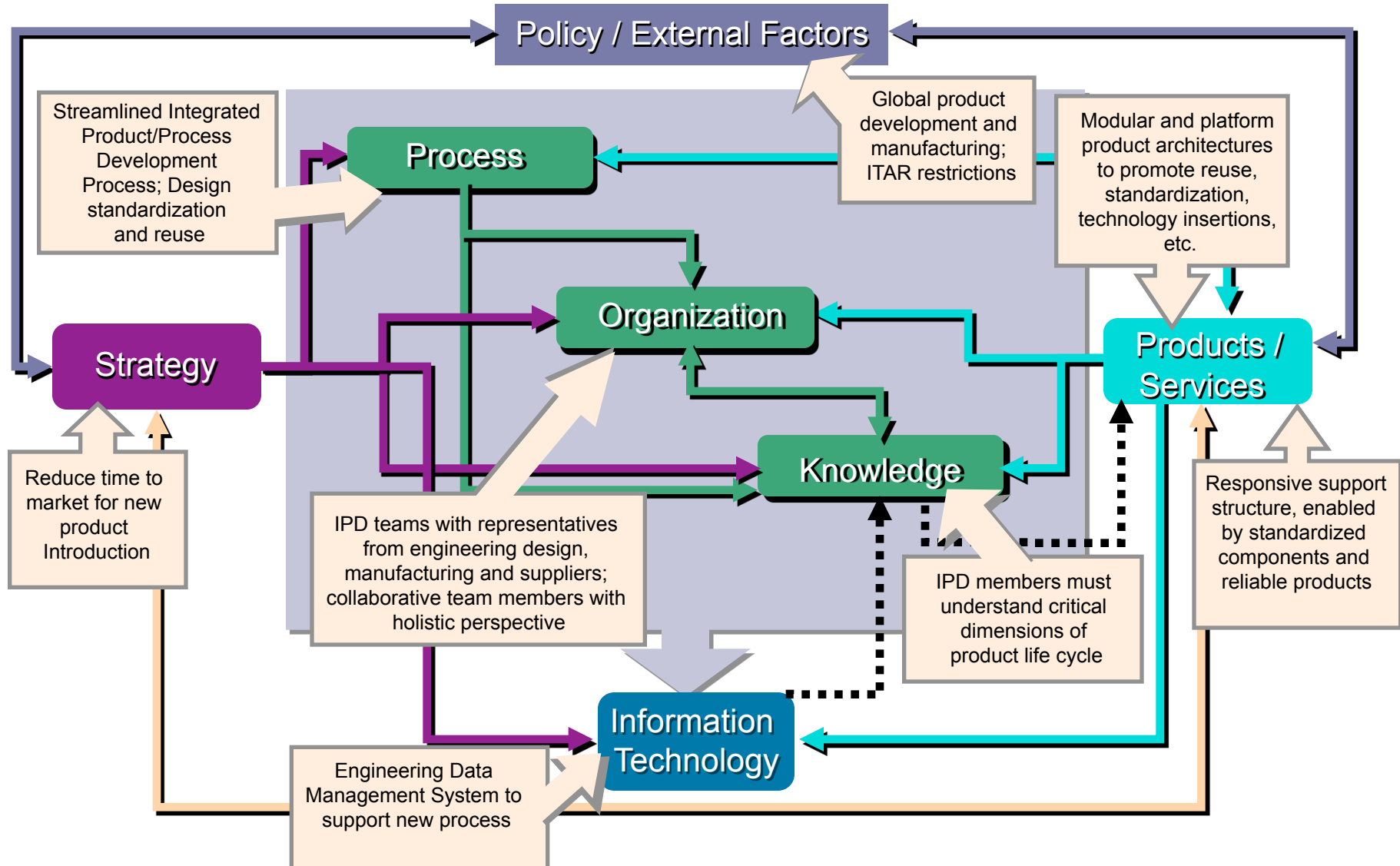
STRATEGIC CYCLE

Leadership

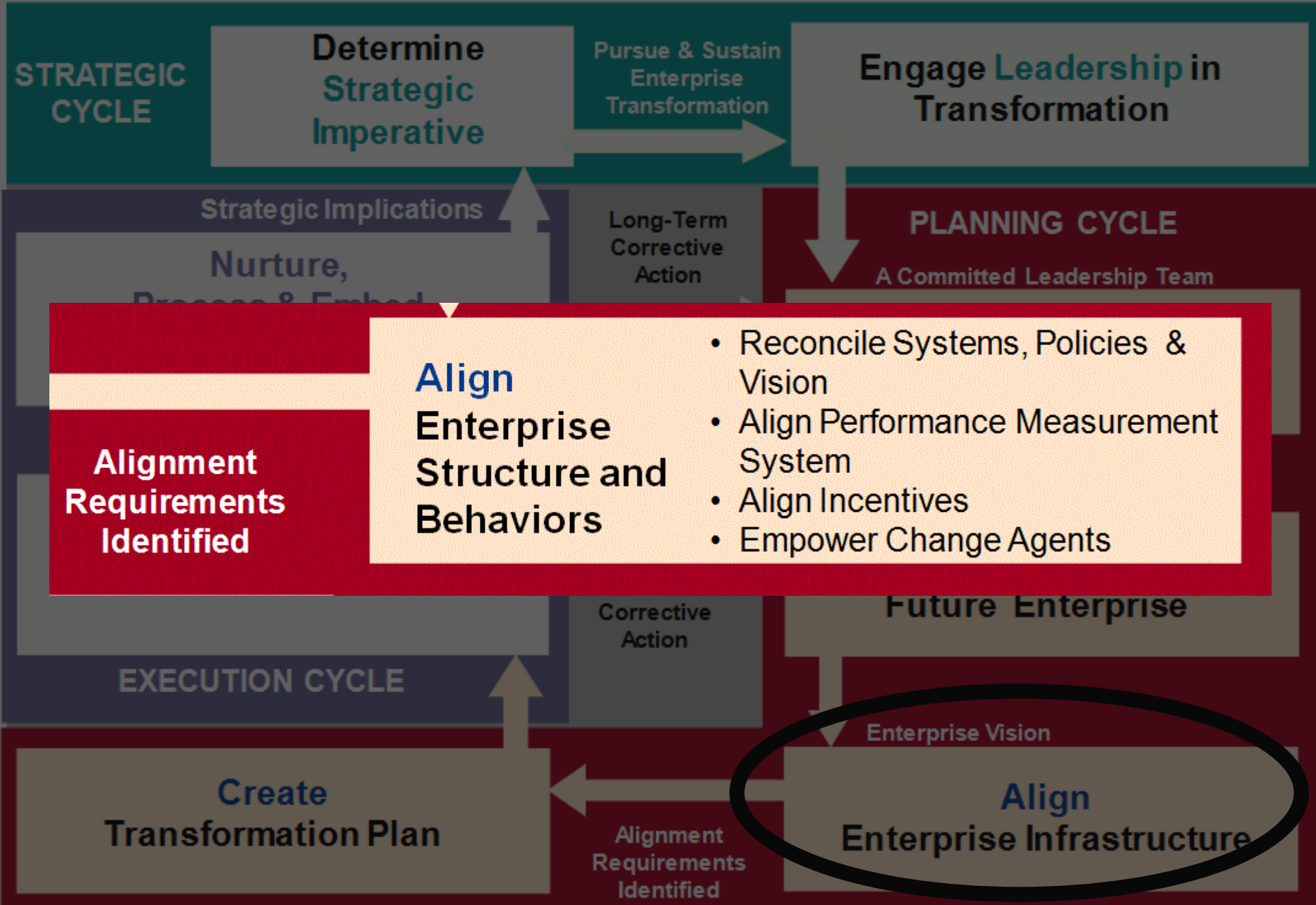
# Enterprise Architecture Framework



# EA Example: Reduce Time to Market Imperative



# LAI Enterprise Transformation Roadmap



STRATEGIC CYCLE

Determine Strategic Imperative

Pursue & Sustain Enterprise Transformation

Engage Leadership in Transformation

Strategic Implications

Nurture, Process & Embed

Long-Term Corrective Action

PLANNING CYCLE

A Committed Leadership Team

Alignment Requirements Identified

Align Enterprise Structure and Behaviors

- Reconcile Systems, Policies & Vision
- Align Performance Measurement System
- Align Incentives
- Empower Change Agents

EXECUTION CYCLE

Corrective Action

Future Enterprise

Create Transformation Plan

Alignment Requirements Identified

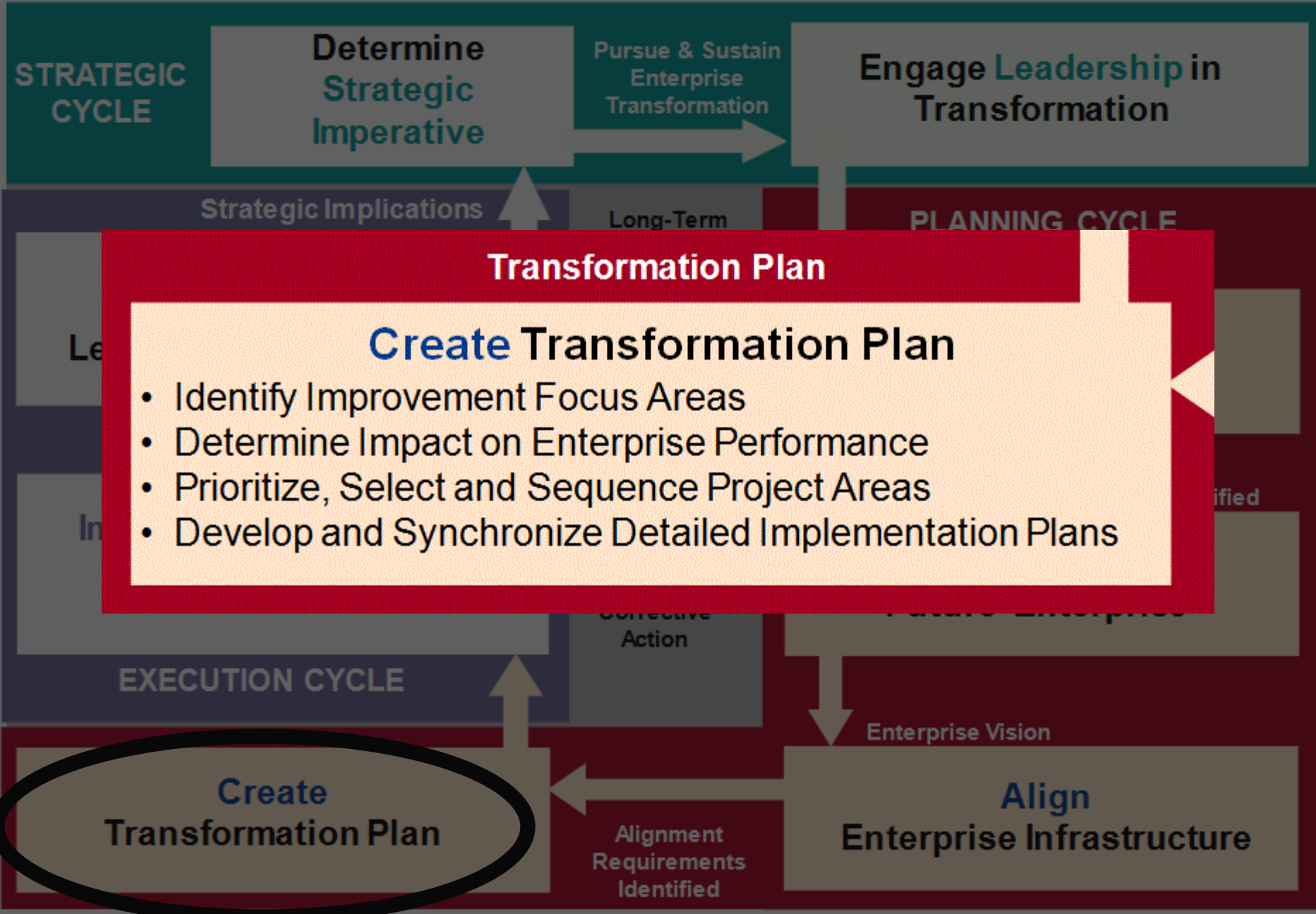
Enterprise Vision

Align Enterprise Infrastructure

# Aligning Performance Measures to Goals for Army Materiel Enterprise

| Strategic Goal                      | Equip units to 100% of materiel requirements on time, every time, with a 33% cost reduction | Reduce cycle time by 50% | Reduce Operations and Maintenance costs for systems by 50% | Achieve 100% data transparency and asset visibility | Be a credible organization respected by all | Develop a skilled, professional, continually improving workforce and be recognized among the top places to work | Become the ME that serves as the benchmark for delivering fully integrated Acquisition, Logistics & Technology capabilities to line |
|-------------------------------------|---|--------------------------|--|---|---|---|---|
| Goal #1: Roles and Responsibilities | ✓   | ✓                        |  | ✓   | ✓   | ✓   | ✓   |
| Goal #2: Industrial Base            | ✓   | ✓                        | ✓  | ✓   | ✓   | ✓   | ✓   |
| Goal #3: Leadership                 | ✓   | ✓                        | ✓  | ✓   | ✓   | ✓   | ✓   |
| Goal #4: Human Capital Strategy     |   | ✓                        |  |   | ✓   | ✓   | ✓   |
| Goal #5: Bus. Processes & Info Tech | ✓   | ✓                        | ✓  | ✓   | ✓   | ✓   | ✓   |

# LAI Enterprise Transformation Roadmap



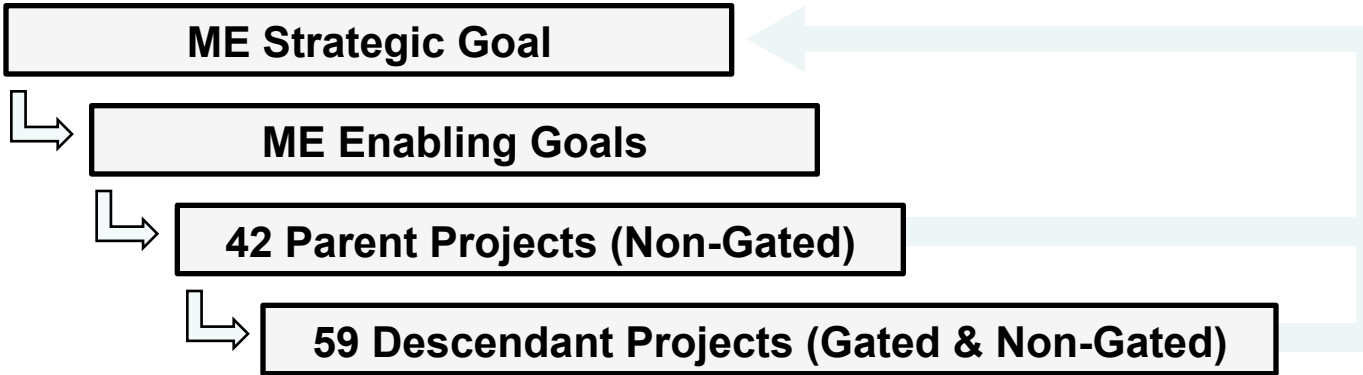
## Transformation Plan

### Create Transformation Plan

- Identify Improvement Focus Areas
- Determine Impact on Enterprise Performance
- Prioritize, Select and Sequence Project Areas
- Develop and Synchronize Detailed Implementation Plans

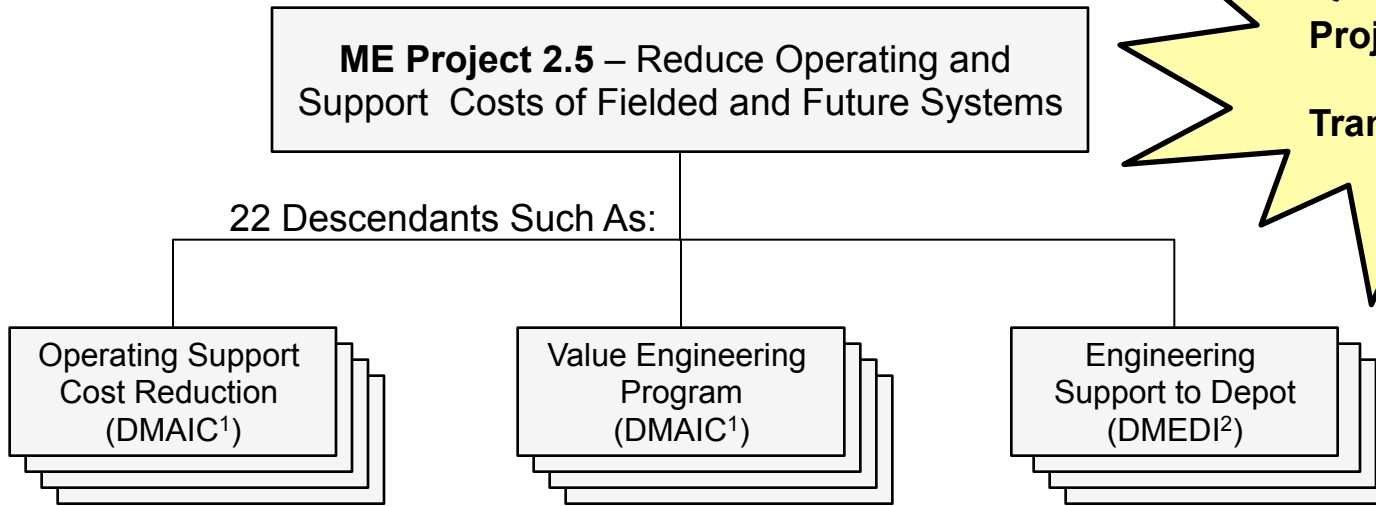
Create Transformation Plan

# Execution of Army Materiel Enterprise Transformation Plan



**Goals Drove Project Selection**

## Example:



**Project Results Drove Transformation**

Notes:

1. Five-phased methodology for improving existing processes; Define-Measure-Analyze-Improve-Control
2. Five-phased methodology for developing new processes; Define-Measure-Explore-Develop-Implement

# LAI Enterprise Transformation Roadmap

## Implementation Results

### Implement & Coordinate Transformation Plan

- Communicate Transformation Plan
- Commit Resources
- Provide Education & Training
- Implement Projects and Track Progress

### Implement & Coordinate Transformation Plan

Capabilities & Deficiencies Identified

### Envision & Design Future Enterprise

Short-Term Corrective Action

Enterprise Vision

### Create Transformation Plan

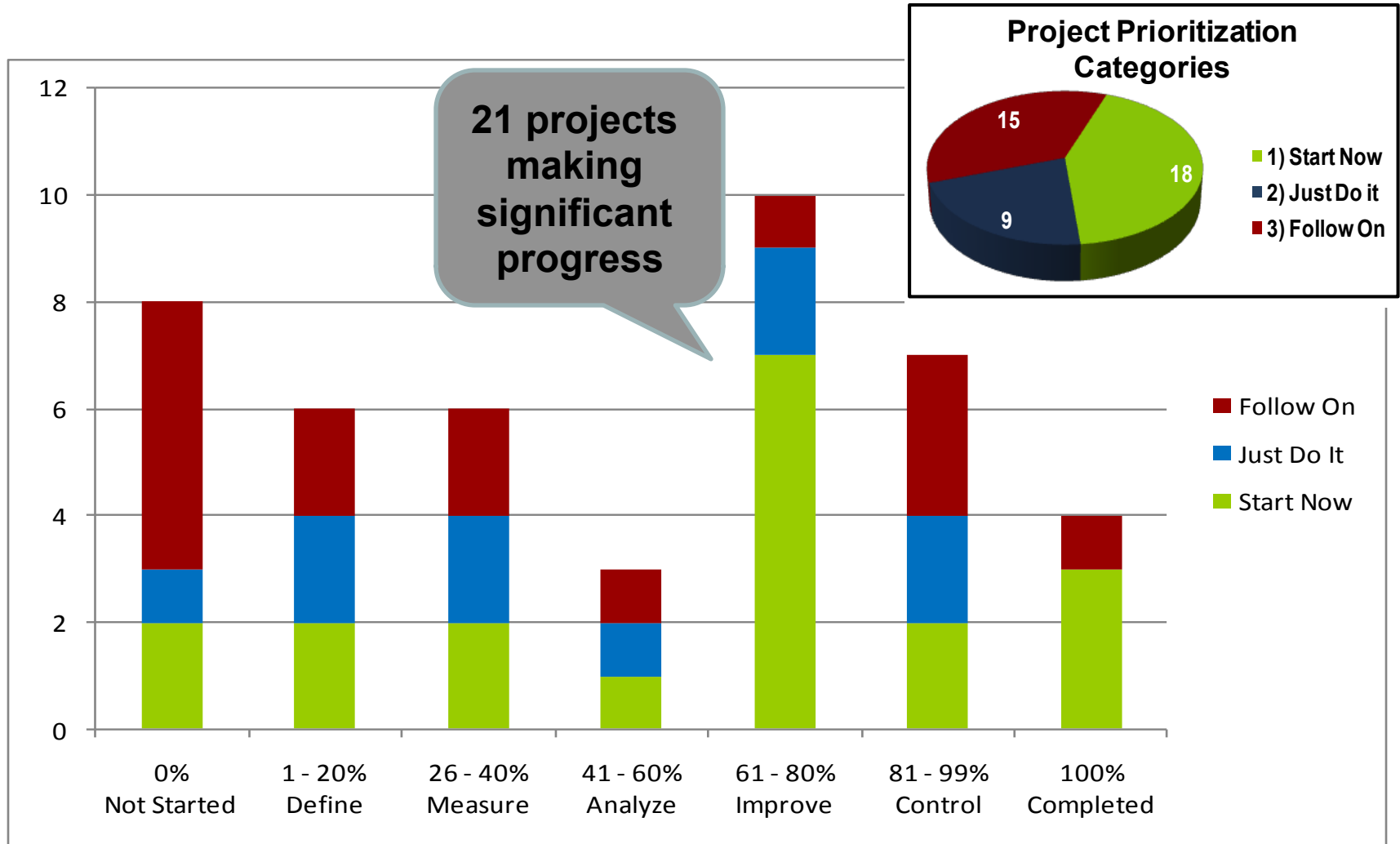
### Align Enterprise Infrastructure

Alignment Requirements Identified

EXECUTION CYCLE



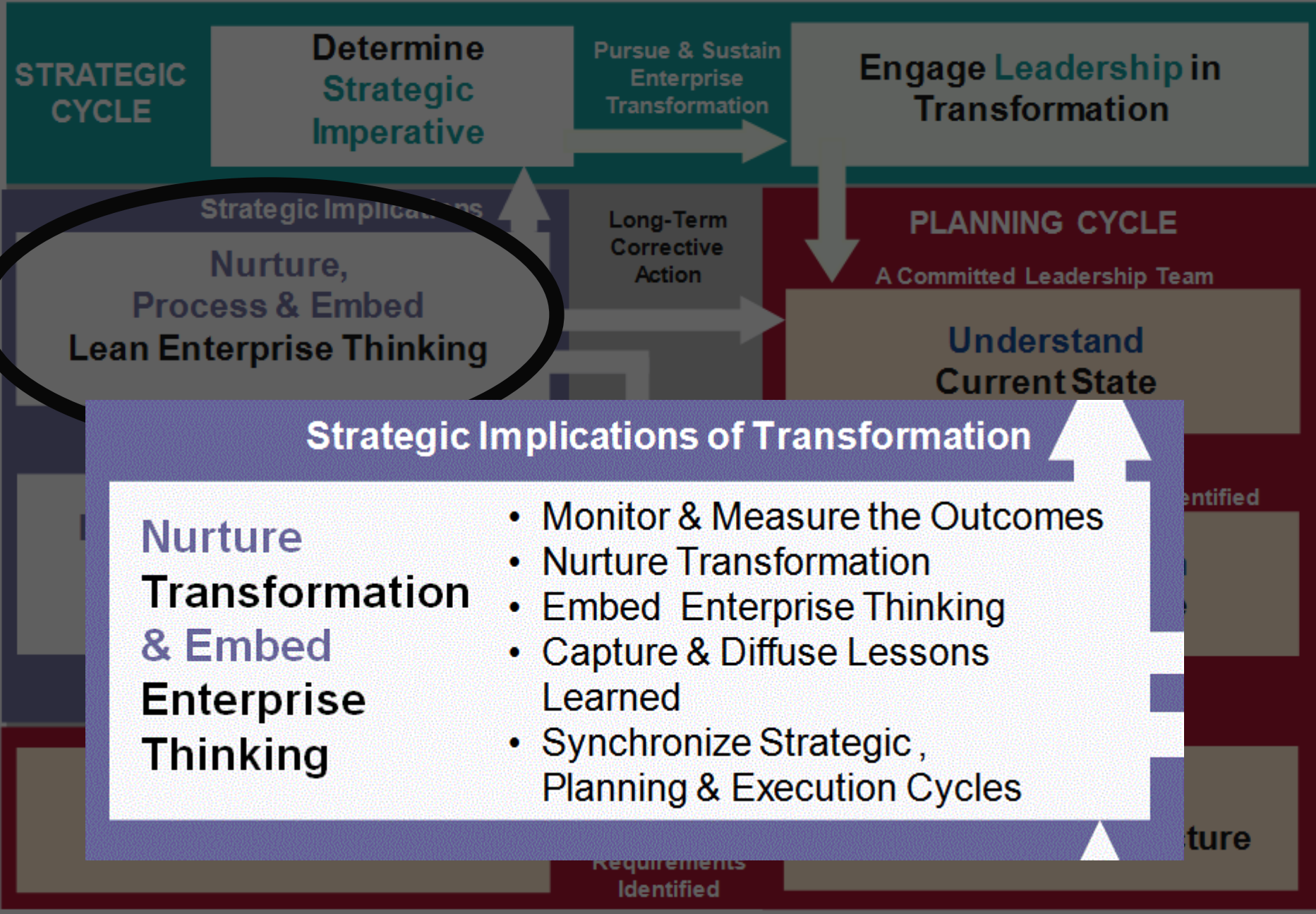
# Status of 42 Army Materiel Enterprise Parent Projects



Note: Start Now Projects were 62% Complete

Data current as of 3 March 2010

# LAI Enterprise Transformation Roadmap




# Summertime Enterprise Thinking



**June 9-10, 2011**

**Epoch-Based Thinking:  
Anticipating System  
and Enterprise  
Strategies for  
Dynamic Futures**


Donna Rhodes, Ph.D.  
Adam Ross, Ph.D.




**June 6-8, 2011**

**Value-Driven  
Tradespace  
Exploration for  
System Design  
Future Enterprise**


Donna Rhodes, Ph.D.  
Adam Ross, Ph.D.



**June 13-14, 2011**

**Architecting  
the Future  
Enterprise**

Prof. Debbie Nightingale  
Donna Rhodes, Ph.D.



**June 20-21, 2011**

**Principles of  
Enterprise  
Transformation**

Prof. Debbie Nightingale  
Jayakanth Srinivasan, Ph.D.

**New Course**



**July 18-20 or July 18-22, 2011**

**LAI Lean Academies:  
Enterprise, Healthcare, and  
Product Development**

|  |                         |  |
|--|-------------------------|--|
| <i>Enterprise Track</i>  | <i>Healthcare Track</i> | <i>PD Track</i>  |
| <i>July 18-20</i>  | <i>July 18-20</i>       | <i>July 21-22</i>  |
| Eric Dickson, M.D.<br>Hugh McManus, Ph.D.<br>Prof. Earl Murman |                         | Eric Rebentisch, Ph.D.<br>Julie Vannerson, M.D.<br>Prof. Annalisa Weigel |



<http://web.mit.edu/professional/>

# Thank You!



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