Service Systems Innovation
for Treatment of
Post-Traumatic Stress in the U.S. Military:
An Enterprise Systems Approach

MIT-SDM 2010 Systems Thinking Conference
Professor Deborah J. Nightingale
Massachusetts Institute of Technology
October 22, 2010

Enterprise as a System

- An enterprise requires the integration of
  - People
  - Processes
  - Organization
  - Information
  - Technology
  - Strategy

- Holistic view

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."

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."
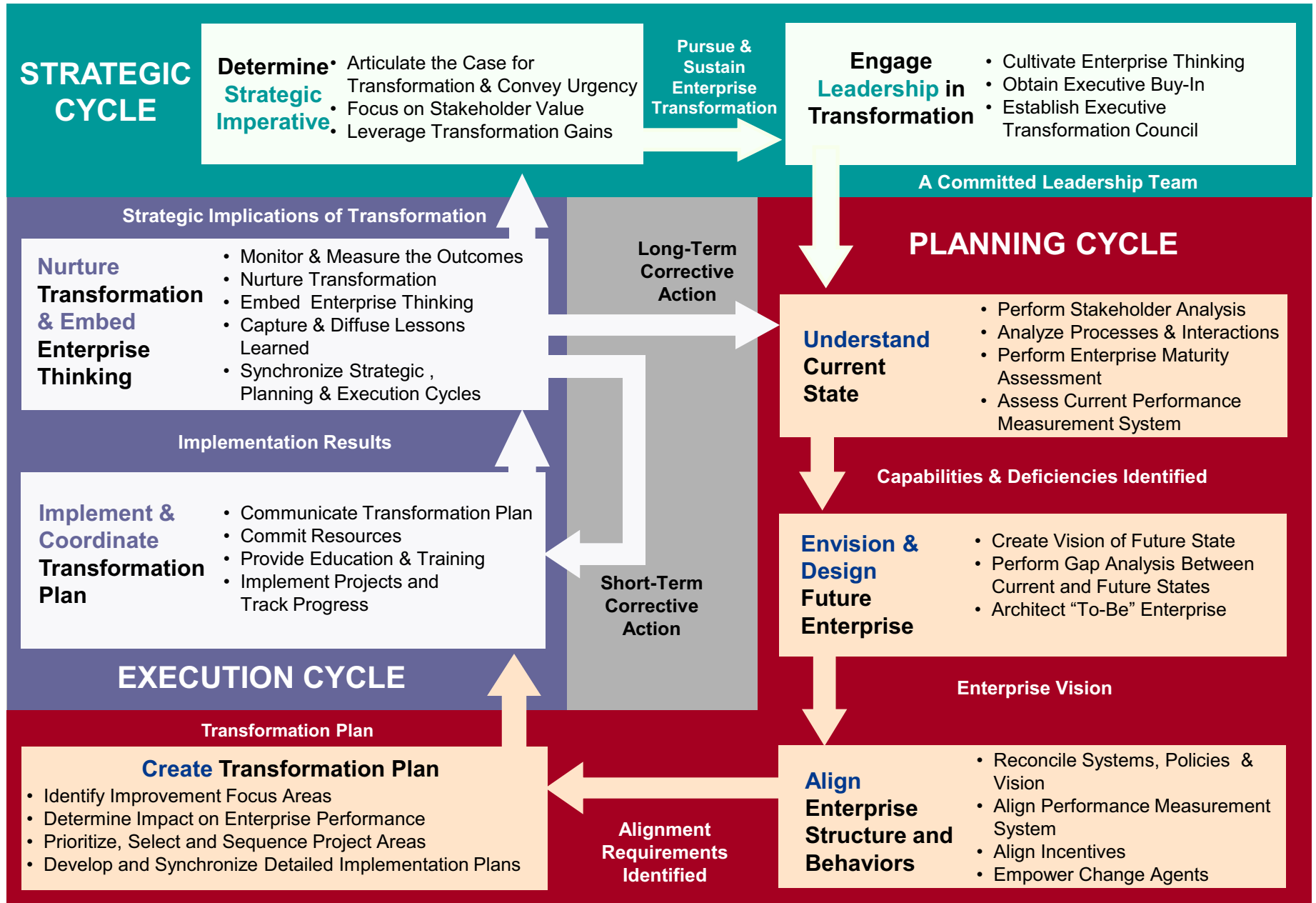
- DoD Task Force on Mental Health, 2007

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 MIT Enterprise Transformation Roadmap

STRATEGIC CYCLE

Determine Strategic Imperative
- Articulate the Case for Transformation & Convey Urgency
- Focus on Stakeholder Value
- Leverage Transformation Gains

Pursue & Sustain Enterprise Transformation

Engage Leadership in Transformation
- Cultivate Enterprise Thinking
- Obtain Executive Buy-In
- Establish Executive Transformation Council

A Committed Leadership Team

PLANNING CYCLE

Strategic Implications of Transformation

Nurture Transformation & Embed Enterprise Thinking
- Monitor & Measure the Outcomes
- Nurture Transformation
- Embed Enterprise Thinking
- Capture & Diffuse Lessons Learned
- Synchronize Strategic , Planning & Execution Cycles

Long-Term Corrective Action

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

Capabilities & Deficiencies Identified

Implementation Results

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

Short-Term Corrective Action

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

Enterprise Vision

EXECUTION CYCLE

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

Alignment Requirements Identified

Align Enterprise Structure and Behaviors
- Reconcile Systems, Policies & Vision
- Align Performance Measurement System
- Align Incentives
- Empower Change Agents

Enterprise Transformation Roadmap

STRATEGIC CYCLE

Determine Strategic Imperative
- Articulate the Case for Transformation & Convey Urgency
- Focus on Stakeholder Value
- Leverage Transformation Gains

Pursue & Sustain Enterprise Transformation

Engage Leadership in Transformation
- Cultivate Enterprise Thinking
- Obtain Executive Buy-In
- Establish Executive Transformation Council

A Committed Leadership Team

Strategic Implications of Transformation

PLANNING CYCLE

Long-Term

Action

Enterprise

EXECUTION CYCLE

Enterprise Vision

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

Alignment Requirements Identified

Align Enterprise Structure and Behaviors
- Reconcile Systems, Policies & Vision
- Align Performance Measurement System
- Align Incentives
- Empower Change Agents

PTSD: A Significant Pathology of War

- Challenges with access to and quality of care
- Challenges with culture and stigma
- Consideration of families

5% to 20% prevalence

Over $2 Billion Invested

Over 125 psychological health programs

Resources: RAND, 2008 Invisible Wounds of War

# Enterprise Systems Thinking Is Needed for Effective Healthcare Services

> *"Systems engineering has had an enormous impact in any number of fields, but it is only beginning to be applied in healthcare.*
>
> *Part of the reason, I suspect, is that so many of the issues in healthcare are difficult to quantify societal questions, such as, should you spend the next marginal dollar on prevention, on research, or on treatment of the stricken?"*

Norman Augustine
Retired Chairman & CEO
Lockheed Martin Corporation

PTSD prevention and care components for the full continuum of care
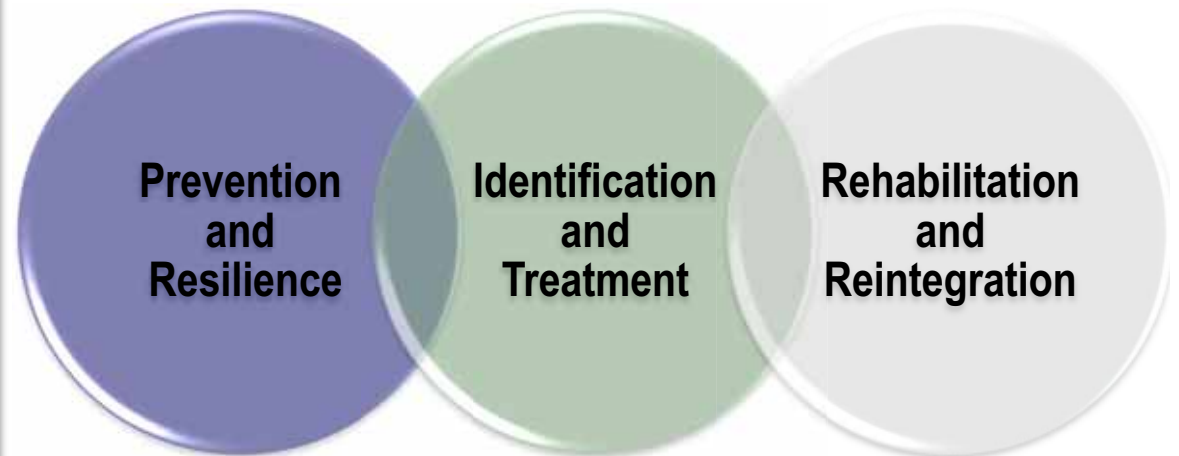
Prevention and Resilience

Identification and Treatment

Rehabilitation and Reintegration

Challenge:

Develop innovative recommendations for transforming the military enterprise to better manage post-traumatic stress, and related conditions, in support of our warriors and their families

LAI MIT 🌐 Enterprise Transformation Roadmap

STRATEGIC CYCLE

Determine Strategic Imperative
- Articulate the Case for Transformation & Convey Urgency
- Focus on Stakeholder Value
- Leverage Transformation Gains

Pursue & Sustain Enterprise Transformation

Engage Leadership in Transformation
- Cultivate Enterprise Thinking
- Obtain Executive Buy-In
- Establish Executive Transformation Council

Strategic Implications of Transformation

Nurture Transformation & Embed Enterprise Thinking

PLANNING CYCLE

Engage Leadership in Transformation
- Cultivate Enterprise Thinking
- Obtain Executive Buy-In
- Establish Executive Transformation Council

A Committed Leadership Team

Implement Coordinated Transformation Plan

EXECUTION CYCLE

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

Alignment Requirements Identified

Enterprise Vision

Align Enterprise Structure and Behaviors
- Reconcile Systems, Policies & Vision
- Align Performance Measurement System
- Align Incentives
- Empower Change Agents

LAI MIT
LEAN ADVANCEMENT INITIATIVE ™

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
Lt. Gen. Eric B. Schoomaker
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

STRATEGIC CYCLE

Determine Strategic Imperative
- Articulate the Case for Transformation & Convey Urgency
- Focus on Stakeholder Value
- Leverage Transformation Gains

Pursue & Sustain Enterprise Transformation

Engage Leadership in Transformation
- Cultivate Enterprise Thinking
- Obtain Executive Buy-In
- Establish Executive Transformation Council

A Committed Leadership Team

Strategic Implications of Transformation

Nurture Transformation & Embed Enterprise Thinking
- Monitor & Measure the Outcomes
- Nurture Transformation
- Embed Enterprise Thinking
- Capture & Diffuse Lessons Learned
- Synchronize Strategic Planning & Execution Cycles

Long-Term Corrective Action

PLANNING CYCLE

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

Implem... Coordi... Transfo... Plan

- Identify I...
- Determin...
- Prioritize...
- Develop...

Identified

- Empower Change Agents

Understand Current State

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

Capabilities & Deficiencies Identified

Post-Traumatic Stress Innovations: U.S. Military Enterprise Analysis

LAI will perform an enterprise analysis of the PTSD process.

Three Phases:

1. Current state analysis

2. Model creation and validation

3. Future scenario planning and recommendations

Current State Analysis

Four Areas of Interest

- Stakeholder analysis

- Enterprise organizations and processes

- Performance measurement systems

- Resources and outcomes

Research Activities

Literature review

Triangulation

Gathering available data

Interviews and site visits
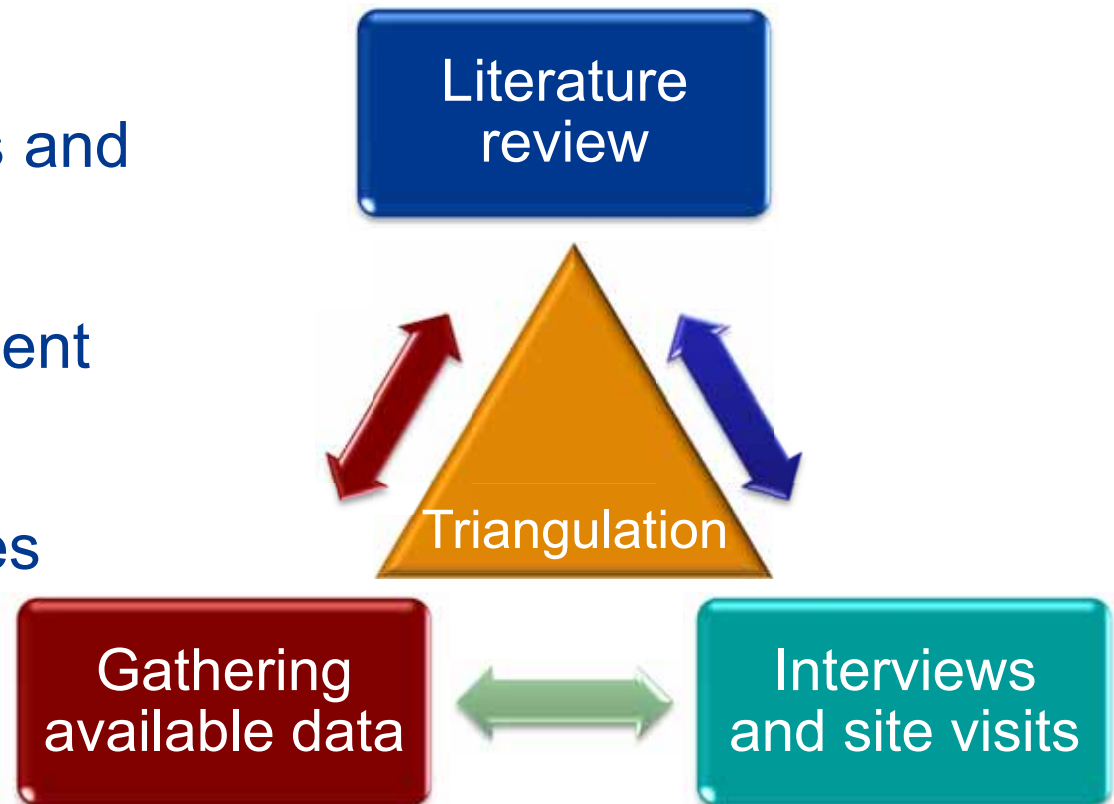
Defining the Enterprise Boundary

Office of the Under Secretary of Defense for Personnel and Readiness
- Health Affairs
- Military Personnel Policy
- Military Community & Family Policy
- Wounded Warrior and Transition Policy (WWCTP)

MHS Component Organizations, including
- MHS Offices and Programs
- TRICARE
- Force, Health Protection and Readiness (FHP&R)
- Defense Centers of Excellence (DCoE)
- Office of the Chief Information Officer (CIO)

JTF CAPMED

The Armed Services
ARMY, including
- Installation Management Command (IMCOM)
- Army Medicine (MEDCOM)

NAVY, including
- Bureau of Naval Personnel
- Bureau of Medicine and Surgery (Navy Medicine)
- Related Marine Corps Organizations

AIR FORCE, including
- Manpower and Personnel (A1)
- Logistics, Installations and Mission Support (A4/7)
- Air Force Medicine

Community Organizations

Veterans Affairs

Key Stakeholder Groups

MHS Leadership
- Military Health System Executive Review members (MHSER)
- Senior Military Medical Advisory Council members (SMMAC)
- Integration Councils/IPTs/ Workgroups

Operational
- Unit leaders
- Medics
- Chaplains

Direct Care
- MTF leadership
- Clinics
- Primary care physicians
- Specialists

Media

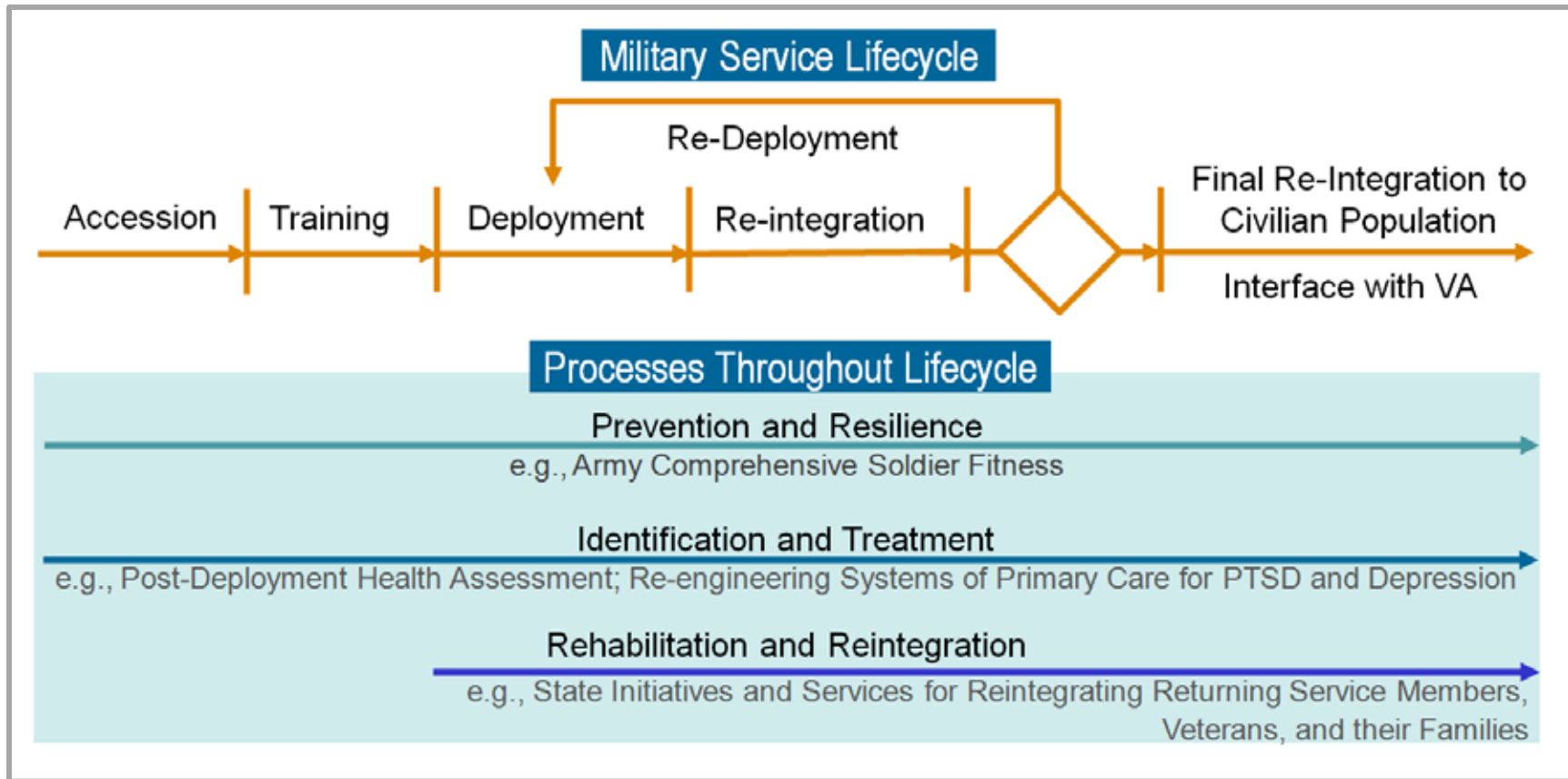**Warriors Families Units**

Service Leadership
- Surgeon Generals
- Installation management
- Intermediate commands

Congress

Purchased Care
- TRICARE regional office
- Managed care contractor
- Individual service provider
  - Doctors
  - Social workers
  - Nurses

Enterprise Processes:
A Service Member-Centric View

Holistic approach to the observation of occupational stress-related processes cross the military service lifecycle that relate both to service members and their families
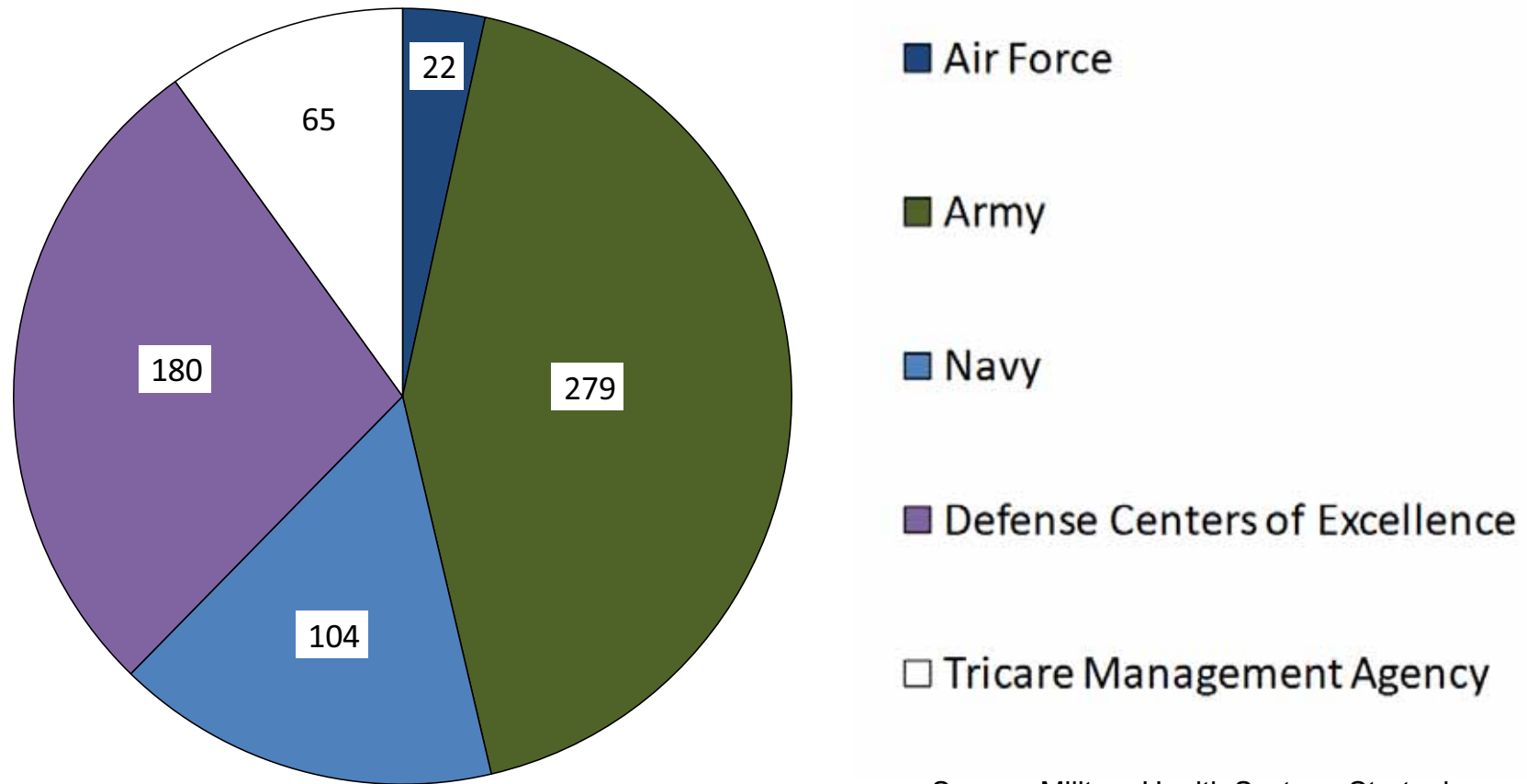
Performance Measurement Analysis

- Identify how performance measurement currently enables the enterprise to effectively translate strategy into action and drive continuous improvement

- Observations:
  - MHS balanced scorecard is used as the primary performance measurement system
  - 54 enterprise metrics currently being tracked (2 related to psychological health)
  - The performance measurement systems between TriCare and the services have not yet been integrated into a holistic system
  - Growing emphasis on alignment through collaborative development of enterprise metrics

Resources and Outcomes

- Compile and review existing data, models and resources to define the approach needed for dynamic enterprise modeling and analysis

- Observations

  - Large volumes of data are being collected and analyzed.

  - Current models take a data-intensive, statistical analysis approach.

  - Flexible systems dynamics and discrete-event simulation models are needed.

FY2010 U.S. Military Psychological Health Budget ($ millions)

Legend:
- Air Force — 22
- Army — 279
- Navy — 104
- Defense Centers of Excellence — 180
- Tricare Management Agency — 65

TOTAL: $715M

Source: Military Health System, Strategic Planning Office

LAI MIT 🌐 Enterprise Transformation Roadmap

STRATEGIC CYCLE

Pursue &

Envision & Design Future Enterprise

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

Enterprise Vision

Nurture Transformation & Embed Enterprise Thinking

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

Short-Term Corrective Action

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

Enterprise Vision

EXECUTION CYCLE

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

Alignment Requirements Identified

Align Enterprise Structure and Behaviors
- Reconcile Systems, Policies & Vision
- Align Performance Measurement System
- Align Incentives
- Empower Change Agents

LAI will perform an enterprise analysis of the PTSD process.

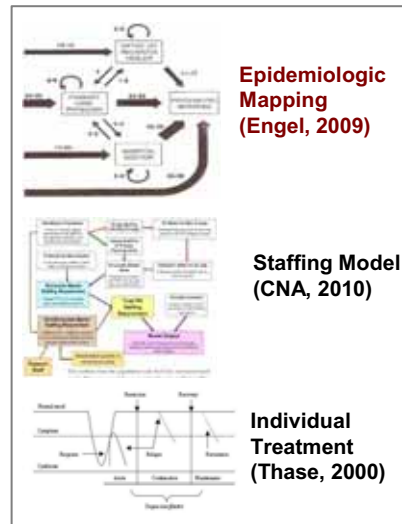**Three Phases:**

1. Current state analysis
2. Model creation and validation
3. Future scenario planning and recommendations

Enterprise Modeling – Quantitative Evaluation

PTSD Prevention and Care Components for a Full Continuum of Care

| Prevention and Resilience | Identification and Treatment (MHS) | Rehabilitation and Reintegration (MHS) | Identification and Treatment (VA) | Rehabilitation and Reintegration (VA) |

Existing Models

?

Epidemiologic Mapping (Engel, 2009)

Staffing Model (CNA, 2010)

Individual Treatment (Thase, 2000)

? 　 ? 　 ?

- Quantitative modeling for treatment does exist

- These models capture the as-is baseline and need to be adapted to support evaluating architectural alternatives and policy development

Motivation for Enterprise Architecting

- In order to transform an enterprise we need to know not only where we are, but more importantly where we want to be (future state)

- In enterprise value analysis how do we define the "future state" of the enterprise?

- Once we define the future "vision" how do we design the enterprise?

- How do we incorporate the multiple dimensions or "views" at the enterprise level?

Enterprise Architecting –
Enables Greater Efficiency and Effectiveness
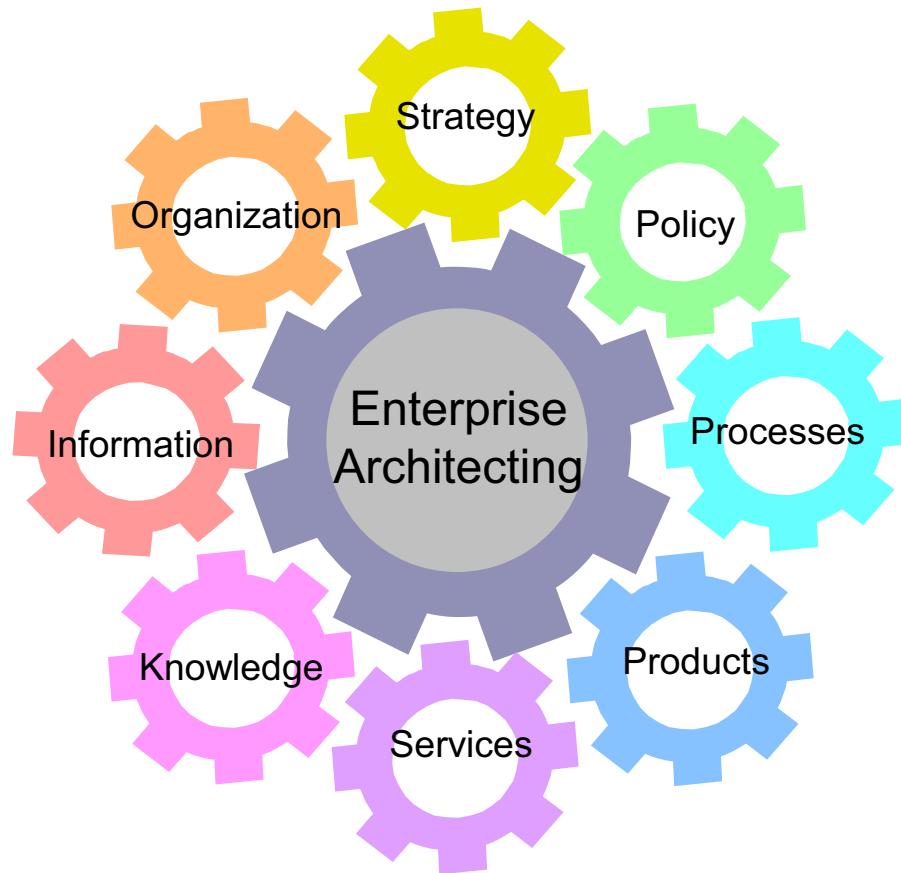
- Effective integration – managing complex interdependencies

- System optimization, not local optimization

- Knowledge-based enterprise capabilities

- Achieving desired future state characteristics

  - Agility
  - Flexibility
  - Reconfigurability

LAI Enterprise Transformation Roadmap

STRATEGIC CYCLE

Determine Strategic Imperative
- Articulate the Case for Transformation & Convey Urgency
- Focus on Stakeholder Value
- Leverage Transformation Gains

Pursue & Sustain Enterprise Transformation

Engage Leadership in Transformation
- Cultivate Enterprise Thinking
- Obtain Executive Buy-In
- Establish Executive Transformation Council

A Committed Leadership Team

Strategic Implications of Transformation

Nurture Transformation
- Monitor & Measure the Outcomes
- Nurture Transformation
- Embed Enterprise Thinking

Long-Term Corrective Action

PLANNING CYCLE
- Perform Stakeholder Analysis

Alignment Requirements Identified

Align Enterprise Structure and Behaviors
- Reconcile Systems, Policies & Vision
- Align Performance Measurement System
- Align Incentives
- Empower Change Agents

Corrective Action

Enterprise
- Architect "To-Be" Enterprise

EXECUTION CYCLE

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

Alignment Requirements Identified

Enterprise Vision

Align Enterprise Structure and Behaviors
- Reconcile Systems, Policies & Vision
- Align Performance Measurement System
- Align Incentives
- Empower Change Agents

- Match resource allocation to enterprise needs
    - Availability of treatment facilities
    - Adequacy of research and development efforts
    - Accessibility of health care providers

- Align incentives and behaviors

- Holistic alignment of strategic objectives, stakeholder values, enterprise processes and performance measures

X-Matrix as a Systems Tool for Enterprise Alignment

LAI 🌐 Enterprise Transformation Roadmap

STRATEGIC CYCLE

Determine Strategic Imperative
- Articulate the Case for Transformation & Convey Urgency
- Focus on Stakeholder Value
- Leverage Transformation Gains

Pursue & Sustain Enterprise Transformation

Engage Leadership in Transformation
- Cultivate Enterprise Thinking
- Obtain Executive Buy-In
- Establish Executive Transformation Council

A Committed Leadership Team

Strategic Implications of Transformation

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

EXECUTION CYCLE

Enterprise Vision

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

Alignment Requirements Identified

Align Enterprise Structure and Behaviors
- Reconcile Systems, Policies & Vision
- Align Performance Measurement System
- Align Incentives
- Empower Change Agents

Anticipated Recommendations

- Refine the value proposition centered around warriors and their families

- Determine high-leverage opportunities for improving the continuum of care

- Revise policies and procedures to enhance system performance

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

Short-Term Corrective Action

Capabilities & Deficiencies Identified

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

Enterprise Vision

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

Transformation Plan

Alignment Requirements Identified

Align Enterprise Structure and Behaviors
- Reconcile Systems, Policies & Vision
- Align Performance Measurement System
- Align Incentives
- Empower Change Agents

LAI 🌐 Enterprise Transformation Roadmap

STRATEGIC CYCLE

Determine Strategic Imperative
- Articulate the Case for Transformation & Convey Urgency
- Focus on Stakeholder Value
- Leverage Transformation Gains

Pursue & Sustain Enterprise Transformation

Engage Leadership in Transformation
- Cultivate Enterprise Thinking
- Obtain Executive Buy-In
- Establish Executive Transformation Council

A Committed Leadership Team

Strategic Implications of Transformation

Nurture Transformation & Embed Enterprise Thinking
- Monitor & Measure the Outcomes
- Nurture Transformation
- Embed Enterprise Thinking
- Capture & Diffuse Lessons Learned
- Synchronize Strategic, Planning & Execution Cycles

Long-Term Corrective Action

PLANNING CYCLE

Understand Current State
- Perform Stakeholder Analysis
- Analyze Processes & Interactions
- Perform Enterprise Maturity Assessment
- Assess Current Performance

Strategic Implications of Transformation

Nurture Transformation & Embed Enterprise Thinking

- Monitor & Measure the Outcomes
- Nurture Transformation
- Embed Enterprise Thinking
- Capture & Diffuse Lessons Learned
- Synchronize Strategic, Planning & Execution Cycles

LAI MIT 🌐 Enterprise Transformation Roadmap

STRATEGIC CYCLE

Determine Strategic Imperative
- Articulate the Case for Transformation & Convey Urgency
- Focus on Stakeholder Value
- Leverage Transformation Gains

Pursue & Sustain Enterprise Transformation

Engage Leadership in Transformation
- Cultivate Enterprise Thinking
- Obtain Executive Buy-In
- Establish Executive Transformation Council

A Committed Leadership Team

Strategic Implications of Transformation

Nurture Transformation & Embed Enterprise Thinking
- Monitor & Measure the Outcomes
- Nurture Transformation
- Embed Enterprise Thinking
- Capture & Diffuse Lessons Learned
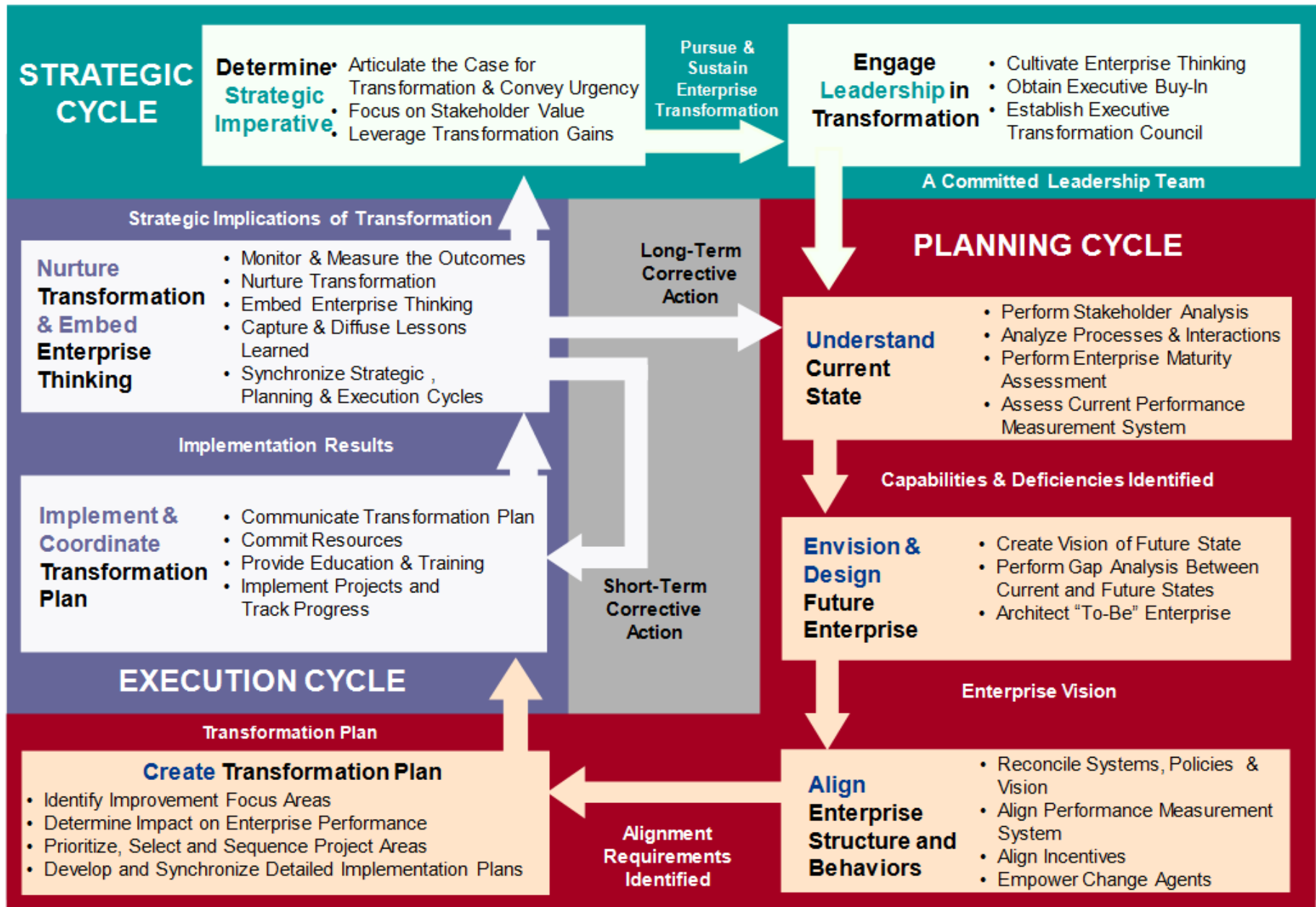- Synchronize Strategic, Planning & Execution Cycles

Long-Term Corrective Action

PLANNING CYCLE

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

Capabilities & Deficiencies Identified

Implementation Results

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

Short-Term Corrective Action

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

Enterprise Vision

EXECUTION CYCLE

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

Alignment Requirements Identified

Align Enterprise Structure and Behaviors
- Reconcile Systems, Policies & Vision
- Align Performance Measurement System
- Align Incentives
- Empower Change Agents

Post-Traumatic Stress Innovations: U.S. Military Enterprise Analysis

Challenge:

Develop innovative recommendations for transforming the military enterprise to better manage post-traumatic stress, and related conditions, in support of our warriors and their families

LAI will perform an enterprise analysis of the PTSD process.

Three Phases:

1. Current state analysis
2. Model creation and validation
3. Future scenario planning and recommendations

Anticipated Outcomes:

- Increased understanding of the total system, including stakeholders and system performance
- Determination of high-leverage opportunities for improving the total systems
- Examination of policy and treatment implications

Thank you!

Professor Deborah Nightingale

Massachusetts Institute of Technology

Room 33-312

Cambridge, Massachusetts 02139

USA

617-253-7339

dnight@mit.edu

http://lean.mit.edu