“Our current system is like a machine to which we just keep adding important and wanted items but without a cohesive strategy for an elegant, interwoven system. Considered on their own, the addition and growth of individual elements may be useful. But when ownership organizations do not see how their contribution fits into the whole (mission) and think their element is an end-state in itself, effective communication and execution are inhibited.”

- ADM William Gortney, ADM Harry Harris, USNI Proceedings, May 2014
• **Mission Level Systems of Systems** – A collection of interoperable platforms and nodes acting as a single system to perform a mission or achieve a mission capability.

Accomplishing a mission has always been a SoS endeavor, but “knitting” the multiple systems together has frequently been left to small communities of systems or to the operators themselves.
“Mission engineering is the deliberate planning, analyzing, organizing, and integrating of current operational and system capabilities to achieve desired mission effects”

Gould, 2016
• **Lead Systems Integration** – An acquisition strategy that employs a series of methods, practices, and principles to increase the span of both management and engineering acquisition authority and control to acquire System of Systems or highly complex systems.

• In 2008 Public Law 110-181, Congress directed Secretary of Defense to:
  – Size and Train the workforce to perform Inherently governmental functions
  – Minimize and eventually eliminate contractors as LSI
Lead Systems Integration (LSI)

- **LSI Function** - Assert and execute system, SoS, and stakeholder trade space to affordably optimize Integrated Warfighting Capabilities across the SoS lifecycle.
  - The roles of the LSI are similar to the roles of any Systems Engineer (SE) or System Integrator (SI). The primary difference is the span of design and integration authority that persists throughout system or SoS acquisition and lifecycle.

**Key objectives:** Affordability; Speed to the Warfighter; Agility; Maximize the Value of Complex Systems.

Graphic Source: www.meicompany.com
The LSI Enterprise Framework

1. **Align control or influence of key LSI Activities** across the Enterprise

2. **Understand organizational dependencies**
   - Internal and External
   - "Who is involved and their equities, interests, relationships, or impacts"

3. **Empower decisions** (organizational authority and conflict resolution)
   - via governance to achieve capability
   - using Universal Enabling Resources aligned to LSI touch points
   - within the context of the Stakeholder Architecture

4. **Align and leverage resources** to enable LSI functions

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**LSI Architecture**

- **Enterprise Capability**
  - LSI Touchpoints
  - LSI Function: "LSI Touch points: What any LSI does"

- **System Capability**
  - LSI Function: "Who is involved and their equities, interests, relationships, or impacts"

- **Mission Capability**
  - LSI Function: "How an LSI makes decisions and enacts those decisions"

- **Resource Management**
  - LSI Function: "How an LSI makes decisions and enacts those decisions"

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**Universal Enabling Resources**

- **Staffing & Workforce Development**
- **Authoritative Data in Context**
- **Policy**
- **Resource Management**

"Four universal and inter-related elements span every level and affect every Key LSI Touch point / product for the LSI function"
LSI Touchpoint Attributes and Principles

Multidisciplinary – apply at any “level” of LSI

Identifies highest payoff points of LSI control or influence to assert and execute trade space – aligned across the enterprise

Enables organizational agility
Mission engineering requires analysis at several levels of the LSI Architecture simultaneously.

- **Enterprise Level**
  - Naval Aviation Enterprise

- **Mission Wholeness Level**
  - Counter-Air
  - Strike

- **System Level**
  - Aircraft
  - Weapons
  - Sensor

- **Allocated Subsystem Level**
  - Avionics
  - Communications
The Architecture informs LSI processes, communication methods, and governance strategies in order to best influence trade space.

SOURCE: NPS Cohort 2 Report, 2015
Constituent systems are developed asynchronously.

LSI architecture must guide and inform simultaneous and distributed concept development, technology development, and system engineering and manufacturing.

• “Universal Enabling Resources” are resources any LSI uses to support LSI-unique execution at each of the “LSI touchpoints” – to assert and execute trade space

• These four fundamental enablers apply at any level in the Enterprise LSI Framework

SOURCE: NPS Cohort 2 Report, 2015
“Governance is the structure and relationships among key stakeholders that determine an organization’s direction and performance.”


- Provide the set of decision-making criteria, policies, processes, and actions that guide the responsible organizations (within the stakeholder architecture) to achieve Enterprise SoS goals and objectives
- Define communication paths and decision authority within the stakeholder “architecture” for conflict resolution
- Charter decision bodies to alter the actions of individuals and organizations in support of the LSI effort
- Governance derives from the agreements between key stakeholders, at all levels of LSI, on how to achieve a common goal

Governance Considerations: “The Framework in Motion”
How any LSI makes decisions and enacts those decisions

SOURCE: NPS Cohort 2 Report, 2015
Empower decisions (organizational authority and conflict resolution) via governance to achieve capability – using Universal Enabling Resources aligned to LSI touch points - within the context of the Stakeholder Architecture

Align and leverage resources to enable LSI functions

1. Align control or influence of key LSI Activities across the Enterprise

2. Understand organizational dependencies Internal and External

   “Who is involved and their equities, interests, relationships, or impacts”

3. LSI Governance

   “How an LSI makes decisions and enacts those decisions”

4. LSI Architecture

   “LSI Touch points: What any LSI does”

   “Four universal and inter-related elements span every level and affect every Key LSI Touch point / product for the LSI function”
Summary

The LSI Enterprise Framework: A potential Government LSI enabler to “think and act differently”

• Align control or influence of key LSI activities across vertical and horizontal organizational boundaries via common, “high payoff” LSI touchpoints

• Understand organizational interdependencies via Stakeholder “Architecture” / Management

• Align and leverage organizational resources to enable inherently governmental LSI functions

• Empower decisions via governance (authority and conflict resolution)