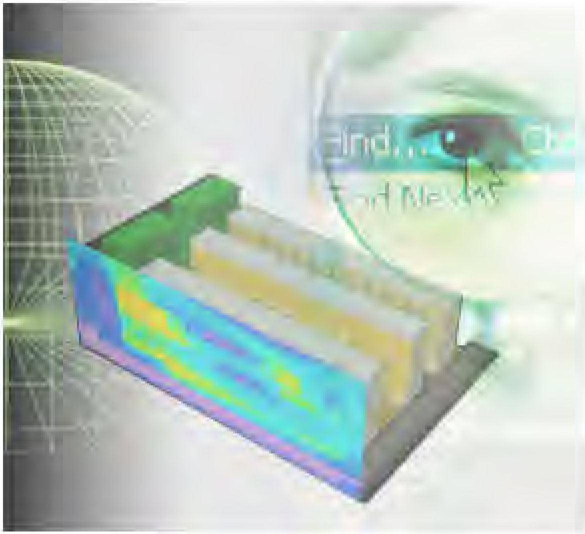
Welcome to Technical Activities

This lesson will help you understand the role of the life cycle logistician (LCL) with regards to various technical activities needed to establish a product support capability.

Technical activities comprise an interdisciplinary approach encompassing the entire technical effort to evolve and verify an integrated and total life cycle that is a balanced set of systems, people, and process solutions that satisfy customer needs.



Objectives

Upon completion of this lesson, you should be able to:

- Identify the LCL's role in systems engineering.
- Recognize the two components of system engineering processes and the role the LCL plays in each.
- Identify the LCL's role in Joint Capability Technology Demonstrations (JCTD) management.
- Define open systems, open standards and interoperability.
- Recognize the five principles of Modular Open Systems Approach (MOSA).
- Identify the benefits of MOSA to supportability.

Systems Engineering

What is systems engineering? Systems engineering is the overarching technical process that a program team applies to move from a desired capability to an operationally effective and suitable system. It creates and verifies an integrated, life cycle balanced set of system product and process solutions that satisfy stated customer needs. Systems engineering integrates the development of the system with the development of all system-related processes. Select each box to read about how each plays in the systems engineering process.

DoD Policy

Program Manager

Costing

Systems Engineering

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DoD Policy

DoD policy on life cycle management (LCM) emphasizes the importance of technical and design issues as they relate to product support and the overall affordability of defense capabilities. A total life cycle, total systems approach to system planning, development, and implementation is fundamental to systems engineering.

Manager

Systems Engineering

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Program Manager

Program managers should consider nearly all systems development decisions in the context of the effect that decision will have on the long-term operational effectiveness and suitability of the system.

DoD Policy | Program Manager | Costing

Systems Engineering

What is systems engineering? Systems engineering is the overarching technical process that a program team applies to move from a desired capability to an operationally effective and suitable system. It creates and verifies an integrated, life cycle balanced set of system product and process solutions that satisfy stated customer needs. Systems engineering integrates the development of the system with the development of all system-related processes. Select each box to read about how each plays in the systems engineering process.

Cost

The cost to implement a system change increases as a program moves further along the system life cycle. The greatest leverage exists in the early stages of development, when the program is most flexible.

DoD Policy

Program Manager

Costing

Systems Engineering Implementation

Systems engineering is typically implemented through interdisciplinary teams of subject matter experts, often formally chartered as an Integrated Product Team (IPT). The systems engineering program-level IPT translates user-defined desired capabilities into operational system specifications consistent with cost, schedule, performance and supportability constraints.

As the subject matter expert on logistics and supportability, it is important for the LCL to participate in conducting systems engineering. The LCL's role is to ensure that supportability considerations are included in the process of translating desired capabilities into an affordable and supportable system. In other words, the LCL becomes an "honest broker" to keep everyone focused on a "total systems approach."

Each member of the development IPT possesses expertise in one or more disciplines in a system life cycle. Each member of the team applies his/her expertise to the analysis of alternatives through the systems engineering process. For example, HSI practitioners have a skill set that focuses on how the human will interact with the system, including human limitations and constraints based on the system design (i.e. how tasks are performed, workload, situational awareness, etc.)

Systems Engineering Implementation, Cont.

The LCL must ensure that supportability is addressed by the system's design and also ensure that the support concept and plans will be flexible and responsive enough to support the design and resulting system. The LCL's active participation in the systems engineering IPT is essential to ensuring that supportability factors are balanced with schedule, technical performance, and cost objectives.

Successfully implementing a collaborative, proven, disciplined systems engineering process results in a total system solution that is:

- robust to changing technical, production, operating and support environments,
- adaptive to the needs of the user, and
- balanced among the multiple requirements, design considerations, design constraints, support constraints and program budgets.

Design Interface

Design interface, as one of the traditional Integrated Product Support (IPS) elements, is a complex process involving those systems engineering activities that address three relationships directly linked to how a system is designed for supportability. Designed for supportability means:

1. How components or sub-systems within the system are designed and interfaced to achieve the best mix and/or design trade-off among the support elements themselves, (maintenance, supply support, facilities, transportation, etc)
2. How the overall supportability design of the system interfaces with other systems and services external to the system itself (interoperability, standardization, commonality), and
3. How supportability design parameters address operational effectiveness and suitability requirements (reliability, maintainability, availability, interoperability, human systems integration, environmental impact, asset visibility, etc.).

These three relationships all contribute to how the support design achieves readiness, affordable ownership cost, and reduced logistics footprint objectives.

The evolution of the system design and trade-off decisions made throughout the system design and development process is another challenge for the LCL. Close collaboration with the system engineering activities ensures that the support concept, strategy and plans stay aligned with design changes.

The affordability of the program from a life cycle perspective versus a procurement perspective may be very different. These differences deserve management visibility and attention.

Design Interface

Design interface, as one of the traditional Integrated Product Support (IPS) elements, is a complex process invol... y linked to how a system...

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3. How su... requirem... egration, environ...

These three r... able ownership co...

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The affordabi... ve may be very different...

Design Interface

Design Interface is the relationship of logistics-related design parameters to readiness and support resource requirements. Logistics-related design parameters include the following:

- Reliability and maintainability (R&M)
- Human factors
- System safety
- Survivability and vulnerability
- Hazardous material management
- Standardization and interoperability
- Energy management
- Corrosion
- Nondestructive inspection
- Transportability

These logistics-related design parameters are expressed in operational terms rather than inherent values and specifically relate to system readiness objectives and support costs of the system. Design interface really boils down to evaluating all facets of an acquisition, from design to support and operational concepts for logistical impacts to the system itself and the logistics infrastructure.

Design Interface

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Integrated Product Support (IPS)

The 12 IPS Elements are:

- Maintenance Planning & Management
- Supply Support
- Manpower and Personnel
- Support and Test Equipment
- Training and Training Support
- Packaging, Handling, Storage and Transportation
- Facilities & Infrastructure
- Computer Resources
- Technical Data
- Design Interface
- Product Support Management
- Sustaining Engineering

Design Interface, Cont.

KEY- The LCL has the greatest opportunity to influence the design with regards to supportability in the early phases of a program. To accomplish this, the LCL must:

1. Be an active participant in the systems engineering process from day one, and
2. Understand some of the major technical and management processes associated with systems engineering.

During the Materiel Solution Analysis phase, the system's key performance parameters (KPP) are designated and defined in terms of:

- Quantifiable performance metrics (e.g., speed, lethality) to meet mission requirements, affordably, and
- The full range of operational requirements (reliability, effectiveness, logistics footprint, supportability criteria) to sustain the mission over the long term.

Knowledge Review

Translates user-defined desired capabilities into operational system specifications consistent with cost, schedule, and performance constraints to include supportability.

Is this a characteristic of an Integrated Product Team or Design for Supportability?

- [x] Integrated Product Team
- [ ] Design for Supportability

Check Answer

Translates user-defined desired capabilities into operational system specifications consistent with cost, schedule, and performance constraints to include supportability is a characteristic of the **Intregrated Product Team**.

Knowledge Review

As a member, the LCL participates in conducting systems engineering - everyone focuses on a "total systems approach."

Is this a characteristic of an Integrated Product Team or Design for Supportability?

- [x] Integrated Product Team
- [ ] Design for Supportability

Check Answer

Everyone focusing on a "total systems approach" is a characteristic of the **Integrated Product Team**.

Systems Engineering Technical Processes

The LCL plays a key role providing input and analysis on alternative maintenance and logistics concepts. The LCL should understand the major systems engineering processes and the role that the LCL can play in each. This figure illustrates the systems engineering activities related to the technical processes during the Materiel Solution Analysis phase. These technical processes include:

- Stakeholders Requirements Definition
- Requirements Analysis
- Architectural Design
- Implementation
- Integration
- Verification
- Validation
- Transition

Click here to see an enlarged version of the image.

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Systems Engineering Technical Processes

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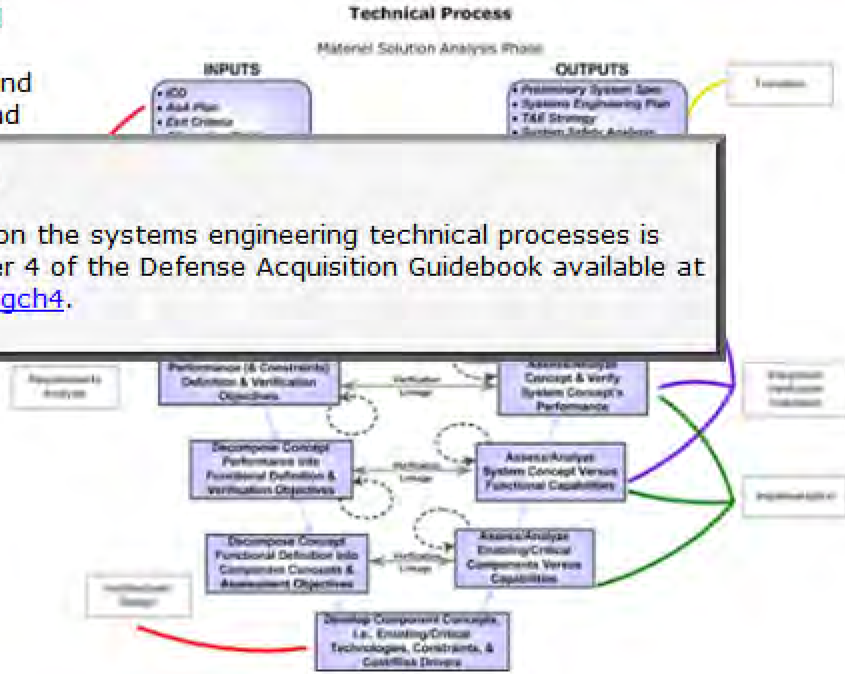

Technical Processes

Additional information on the systems engineering technical processes is available in the Chapter 4 of the Defense Acquisition Guidebook available at https://acc.dau.mil/dagch4.

Click here to see an enlarged version of the image.

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Systems Engineering Technical Processes

Long Description

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Starting from the upper left, the first box is labeled "INPUTS" and contains 4 bullets: ICD, AoA Plan, Exit Criteria, and Alternative Maintenance & Sustainment Concepts.

The second box contains the activities: Interpret User Needs. Analyze Operational Capabilities & Environmental Constraints. Between the second and third boxes is a circular arrow indicating that Trades should be made between the two. The ITR is conducted during this activity. This is indicated by a small circle with the acronym "ITR" on top of the second box. ITR stands for "Initial Technical Review".

The third box contains the activity: Develop Concept Performance (& Constraints) Definition & Verification Objectives.

The fourth box contains the activity: Decompose Concept Performance Into Functional Definition & Verification Objectives.

The fifth box contains the activity: Decompose Concept Functional Definition Into Component Concepts & Assessment Objectives.

Click here to see an enlarged version of the image.

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Systems Engineering Technical Processes

The sixth box is the bottom of the "V" and contains the activity: Develop Component Concepts, i.e., Enabling/Critical Technologies, Constraints, & Cost/Risk Drivers.

The seventh box starts the right side of the "V" from the bottom working up and contains the activity: Assess/Analyze Enabling/ Critical Components Versus Capabilities.

The eighth box contains the activity: Assess/Analyze System Concept Versus Functional Capabilities.

The ninth box contains the activity: Assess/Analyze Concept & Verify System Concept's Performance. Between the ninth and tenth boxes there is a circular arrow indicating that Trades should be made between the two.

The tenth box contains the activity: Assess/Analyze Concepts Versus Defined User Needs & Environmental Constraints. The ASR is produced as a result of this activity. This is represented by a small circle with the acronym "ASR" on top of the tenth box. ASR stands for "Alternative Systems Review".

The eleventh box is labeled "OUTPUTS" and contains six bullets: Preliminary System Spec; Systems Engineering Plan T&E Strategy; System Safety Strategy; Support & Maintenance Concepts & Technologies; and Inputs to draft CDD, -AoA, -TDS, -IBR and Cost/Manpower Estimate.

There are four double-headed dotted arrows across the center of the "V": between boxes two and ten, between boxes 3 and 9, between boxes 4 and 8, and between boxes 5 and 7. The relationship is that

Click here to see an enlarged version of the image.

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Systems Engineering Technical Processes

There are four double-headed dotted arrows across the center of the "V": between boxes two and ten, between boxes 3 and 9, between boxes 4 and 8, and between boxes 5 and 7. The relationship is that the activities on the left leg of the "V" are analyzed and assessed by activities on the right leg of the "V".

In addition to the SE "V", there are external boxes that represent technical management process activities. These are:

- The first box is linked by curved lines to two different boxes labeled "Stakeholders Requirements Development" and "Requirements Analysis". This indicates that these two systems engineering process steps are part of the Requirements Development and Logical Analysis activities.
- The sixth box is linked by a curved line to a box labeled "Architectural Design". This indicates that this systems engineering process step is part of the Design Solution activity.
- The eighth, ninth and tenth boxes are linked by curved lines to a box labeled "Implementation". This indicates that these three systems engineering process steps are part of the Implementation activity.
- The eighth, ninth and tenth boxes are linked by curved lines to a box with labels "Integration", "Verification" and "Validation". This indicates that these three systems engineering process steps are part of the Integration, Verification and Validation activities
- The eleventh box is linked by a curved line to a box labeled "Transition". This indicates that this system engineering process step is part of Transition activity.

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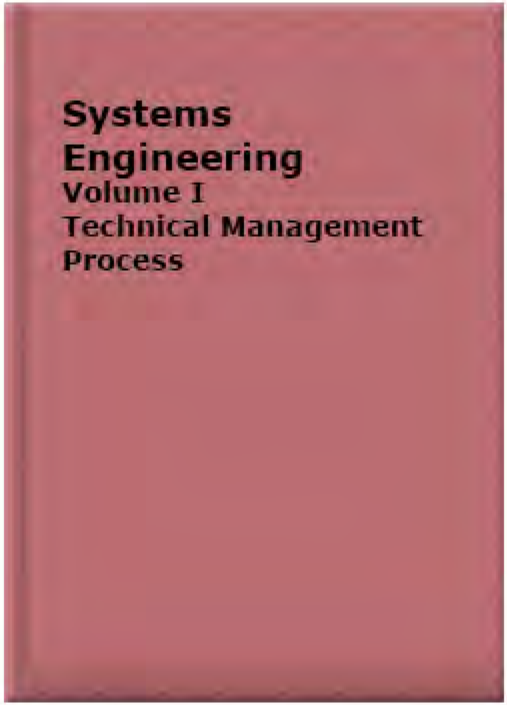
Systems Engineering Technical Processes, Cont.

Systems Engineering Volume I, Technical Management Process Table of Contents:

1. Stakeholder Requirements Definition
2. Requirements Analysis
3. Architectural Design
4. Implementation
5. Integration
6. Verification
7. Validation
8. Transition

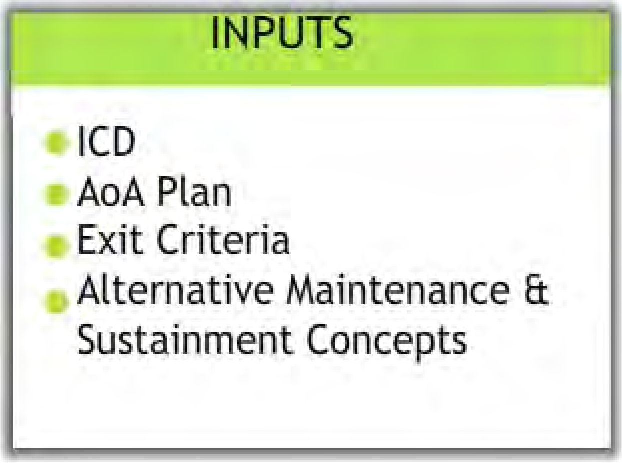


Systems Engineering Technical Processes,

Systems Engineering Volume I, Technical Management Process Table of Contents:

Stakeholder Requirements Definition

The Stakeholder Requirements Definition process elicits inputs from relevant stakeholders and translates the inputs into technical requirements. DoD systems engineers primarily respond to JCIDS documents that express the CONOPS and identify capability gaps in need of a Materiel Solution.
Click here for a long description of the graphic below.



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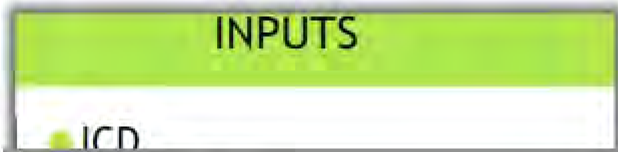

Long Description

The inputs for the Stakeholder Requirements Definition process include:

- ICD
- AoA Plan
- Exit Criteria
- Alternative Maintenance & Sustainment Concepts

Systems Engineering Technical Processes,

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Requirements Analysis

Requirements Analysis encompasses the definition and refinement of system, subsystem, and lower-level functional and performance requirements and interfaces to facilitate the Architechtural Design process. Requirements analysis needs to provide measureable and verifiable requirements.
Click here for a long description of the graphic below.

INPUTS

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Systems Engineering Technical Processes,

Systems Engineering Volume I, Technical Management Process Table of Contents:

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- Exit Criteria
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Systems Engineering Technical Processes,

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Architectural Design

The Architectural Process is a trade and synthesis process. It translates the outputs of Stakeholder Requirements Definition and Requirements Analysis process into alternative design solutions include hardware, software, and human elements; their enabling processes; and related internal and external interfaces. Click here for a long description of the graphic below.

Systems Engineering Technical Processes,

Systems Engineering Volume I, Technical Management Process Table of Contents:

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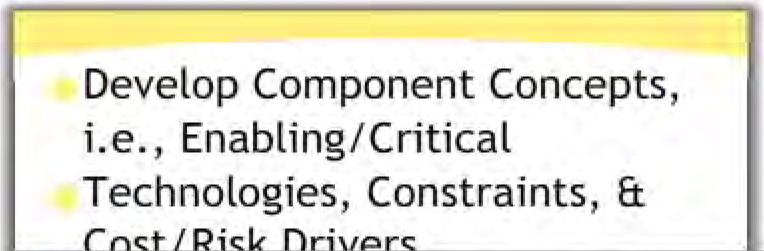

Long Description

The Architectural Process includes developing component concepts (i.e., Enabling/Critical), and Technologies, Constraints, & Cost/Risk Drivers.

Systems Engineering Technical Processes,

Systems Engineering Volume I, Technical Management Process Table of Contents:

Implementation

Implementation is the process that translates a design into a product. The system element is made, bought, or reused. This process gets the system element ready for the processes of Integration, Verification and Validation. Developing the supporting documentation for the system element such as the manuals for operation and maintenance and/ or installation are also part of this process.

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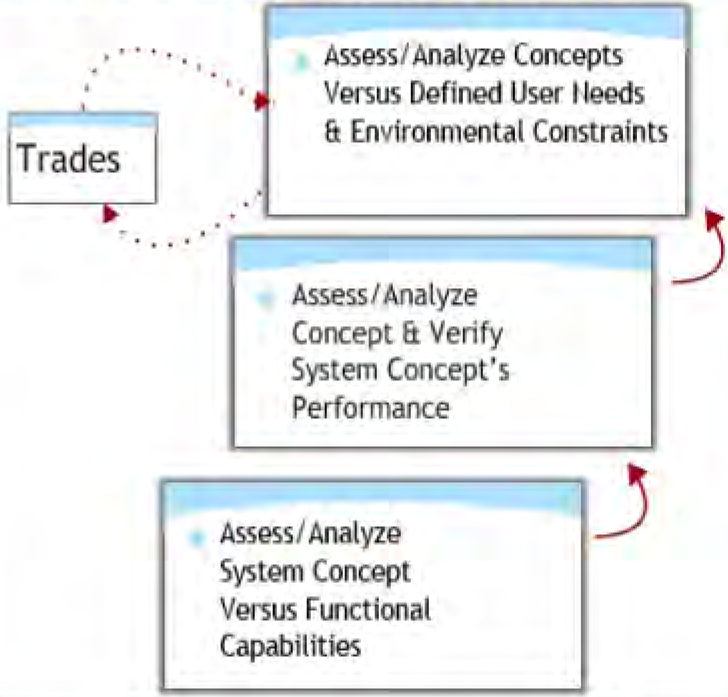

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Click here for a long description of the graphic below.

Long Description

The graphic depicts a representation of the Implementation process. An arrow goes from small blue box labeled 'Trades' into a larger blue box labeled 'Assess/Analyze Concepts Versus Defined User Needs and Environmental Constraints.' Another arrow goes from this box back into the 'Trades' box.

Two additional boxes are tiered beneath:

- Assess/Analyze Concepts & Verify System Concept's Performance
- Assess/Analyze System Concept Versus Functional Capabilities

Systems Engineering Technical Processes,

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Integration

Integration is the process of incorporating lower level system elements into a higher level system element in the physical architecture. Integration also refers to the incorporation of the final system into its operational environment and defined external interfaces. From a supportability perspective the approach to systems integration has implications to the product support integration that will be required to ensure effective performance based support.

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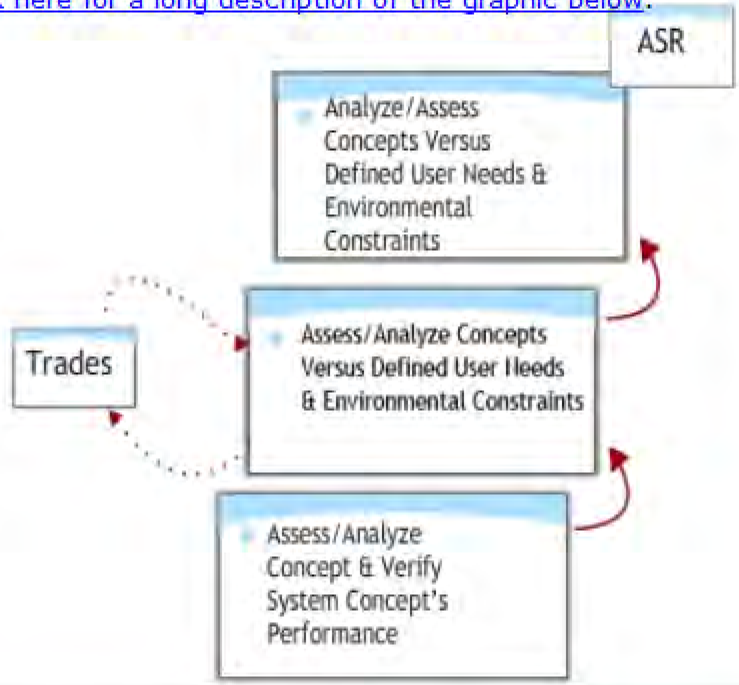

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Click here for a long description of the graphic below.

Long Description

The graphic depicts a representation of the Integration process. Starting from the bottom up, an arrow goes from a blue box labeled 'Assess/Analyze System Concept Concept and Verify System Concept's Performance' into a center box labeled 'Assess/Analyze Concepts Versus Defined User Needs & Environmental Constraints.' An arrow goes from this box into one above it, labeled 'Analyze/Assess Concepts Versus Defined User Needs & Environmental Constraints.' Sitting atop this box is a smaller one labeled 'ASR.'
To the left of the center box is another blue box, this one labeled 'Trades.' Arrows go out from this box into the center one, and back again.

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Systems Engineering Technical Processes,

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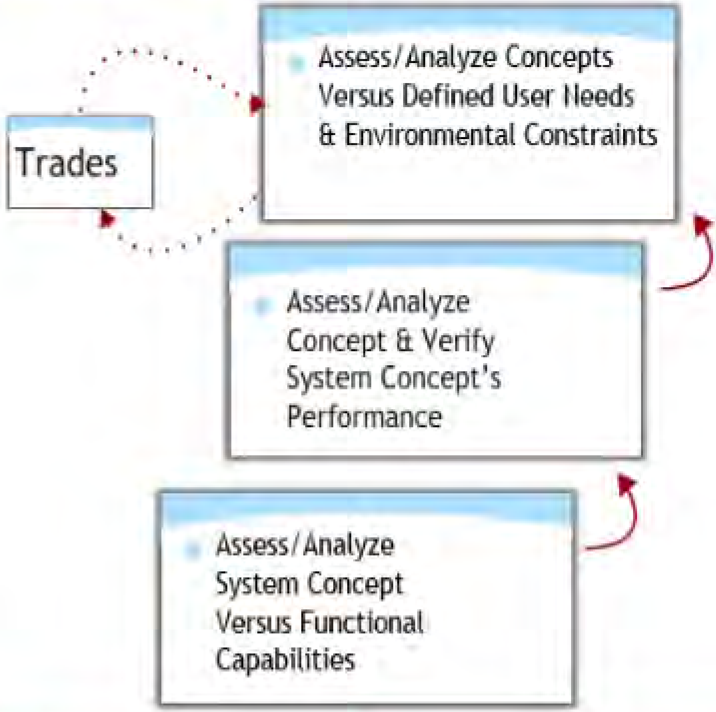
Verification

Verification confirms that the system element meets the design-to or build-to specifications It answers the question "Did you build it right?" The outcome of this process can also have implications to supportability if there are problems.

Click here for a long description of the graphic below.



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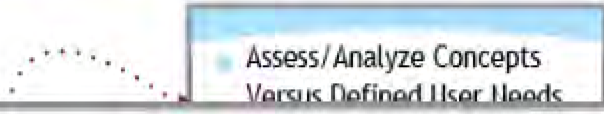

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Two additional boxes are tiered beneath:

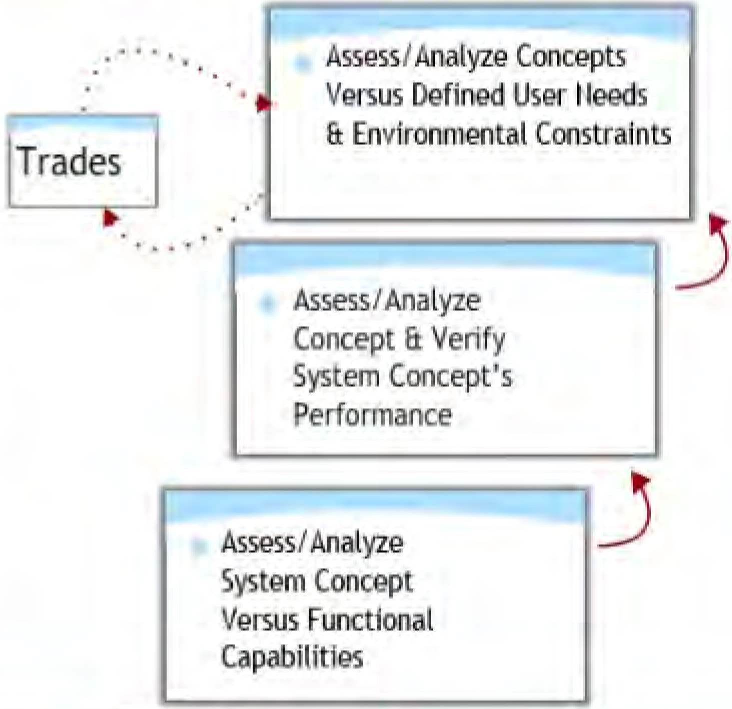
- Assess/Analyze Concepts & Verify System Concept's Performance
- Assess/Analyze System Concept Versus Functional Capabilities

Systems Engineering Technical Processes,

Systems Engineering Volume I, Technical Management Process Table of Contents:

Validation

Validation answers the question of "Did you build the right thing". It tests the performance of systems within their intended operational environment with the anticipated operators, users, and maintainers to include supportability.
Click here for a long description of the graphic below.



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Systems Engineering Technical Processes,

Systems Engineering Volume I, Technical Management Process Table of Contents:

Transition

Transition is the process applied to move the system element to the next level in the physical architecture or, for the end-item system, to the user. This process may include installation at the operator or user site.
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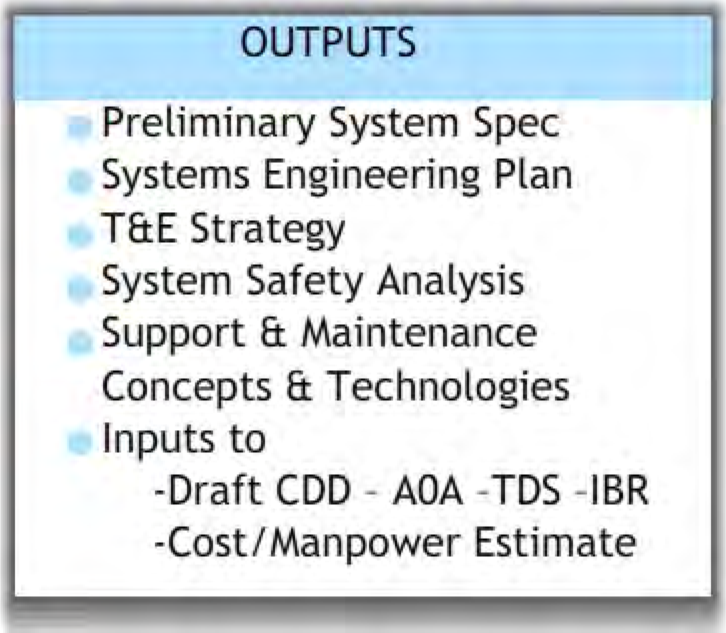

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Click here for a long description of the graphic below.

OUTPUTS

Long Description

The outputs at Transition are:

- Preliminary System Spec
- Systems Engineering Plan
- T&E Strategy
- System Safety Analysis
- Support and Maintenance
- Concepts & Technologies
- Inputs to
  - Draft CDD - A0A - TDS - IBR
  - Cost/Manpower Estimate

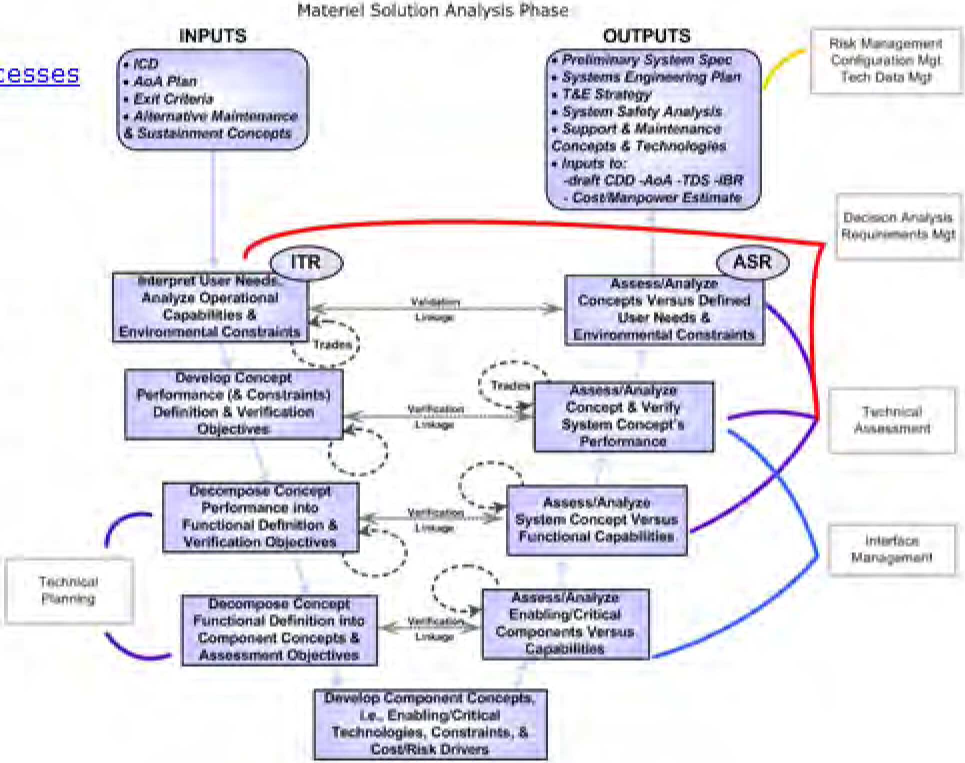
Systems Engineering Management Processes

This figure illustrates the systems engineering activities during the Materiel Solution Analysis.
These technical management processes include:

- Technical Planning
- Interface Management
- Technical Assessment
- Decision Analysis
- Requirements Management
- Risk Management
- Configuration Management
- Technical Data Management

Click here to see an enlarged view of the image.

Technical Management Process



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Systems Engineering Management Processes

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These technical management processes include:

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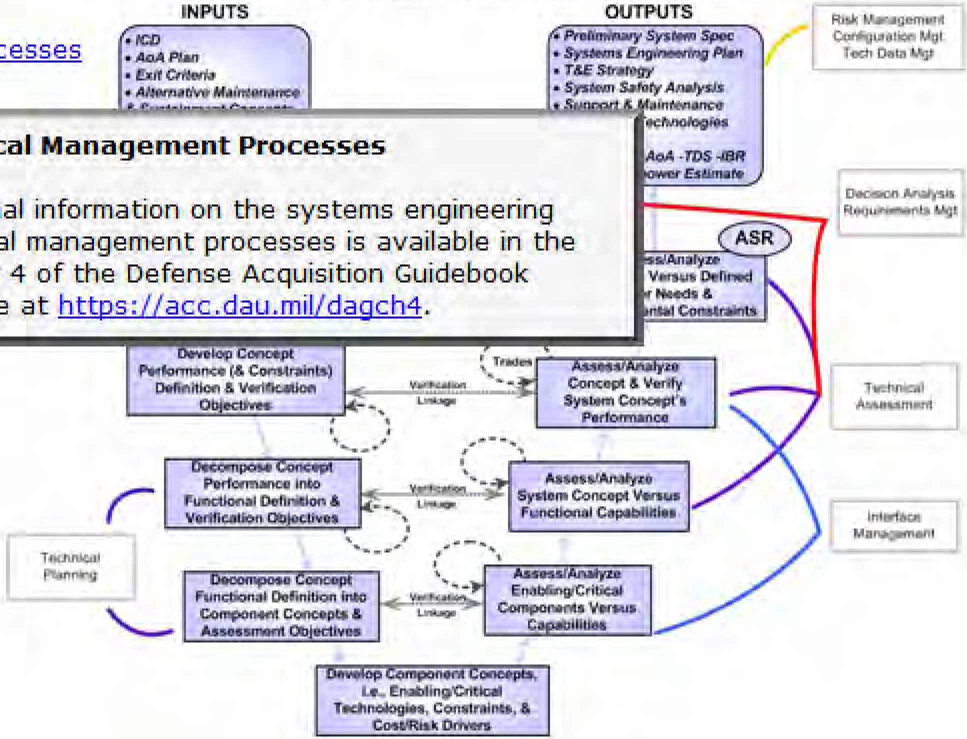
- Technical Assessm
- Decision Analysis
- Requirements Man
- Risk Management
- Configuration Management
- Technical Data Management

Click here to see an enlarged view of the image.

Technical Management Process

Materiel Solution Analysis Phase



Technical Management Processes

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Systems Engineering Management Processes

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The fifth box contains the activity: Decompose Concept Functional Definition Into Component Concepts & Assessment Objectives.

The sixth box is the bottom of the "V" and contains the activity: Develop Component Concepts, i.e.,

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Systems Engineering Management Processes

The sixth box is the bottom of the "V" and contains the activity: Develop Component Concepts, i.e., Enabling/Critical Technologies, Constraints, & Cost/Risk Drivers.

The seventh box starts the right side of the "V" from the bottom working up and contains the activity: Assess/Analyze Enabling/ Critical Components Versus Capabilities.

The eighth box contains the activity: Assess/Analyze System Concept Versus Functional Capabilities.

The ninth box contains the activity: Assess/Analyze Concept & Verify System Concept's Performance. Between the ninth and tenth boxes there is a circular arrow indicating that Trades should be made between the two.

The tenth box contains the activity: Assess/Analyze Concepts Versus Defined User Needs & Environmental Constraints. The ASR is produced as a result of this activity. This is represented by a small circle with the acronym "ASR" on top of the tenth box. ASR stands for "Alternative Systems Review".

The eleventh box is labeled "OUTPUTS" and contains six bullets: Preliminary System Spec; Systems Engineering Plan T&E Strategy; System Safety Strategy; Support & Maintenance Concepts & Technologies; and Inputs to draft CDD, -AoA, -TDS, -IBR and Cost/Manpower Estimate.

There are four double-headed dotted arrows across the center of the "V": between boxes two and ten, between boxes 3 and 9, between boxes 4 and 8, and between boxes 5 and 7. The relationship is that the activities on the left leg of the "V" are analyzed and assessed by activities on the right leg of the "V".

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Systems Engineering Management Processes

Engineering Plan T&E Strategy, System Safety Strategy, Support & Maintenance Concepts & Technologies; and Inputs to draft CDD, -AoA, -TDS, -IBR and Cost/Manpower Estimate.

There are four double-headed dotted arrows across the center of the "V": between boxes two and ten, between boxes 3 and 9, between boxes 4 and 8, and between boxes 5 and 7. The relationship is that the activities on the left leg of the "V" are analyzed and assessed by activities on the right leg of the "V".

In addition to the SE "V", there are external boxes that represent technical management process activities. These are:

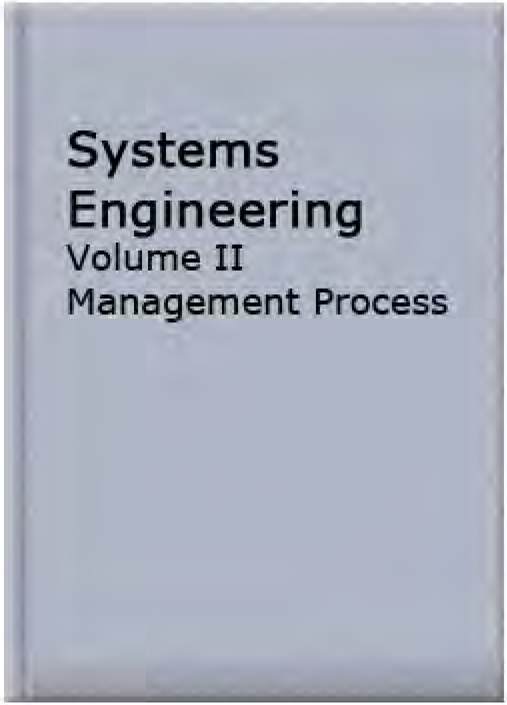
- The fourth and fifth boxes are linked by curved lines to a box labeled "Technical Planning". This indicates that these two systems engineering process steps are part of the Technical Planning activity.
- The seventh and ninth boxes are linked by curved lines to a box labeled "Interface Management". This indicates that these two systems engineering process steps are part of the Interface Management activity.
- The eighth, ninth and tenth boxes are linked by curved lines to a box labeled "Technical Assessment". This indicates that these three systems engineering process steps are part of the Technical Assessment activity.
- The first, eighth, ninth and tenth boxes are linked by curved lines to a box labeled "Decision Analysis" and "Requirements Mgt". This indicates that these four systems engineering process steps are part of the Decision Analysis and Requirements Management activities
- The eleventh box is linked by a curved line to a box labeled "Risk Management", "Configuration Mgt" and "Tech Data Mgt". This indicates that this system engineering process step is part of Risk Management, Configuration Management and Technical Data Management activities.

D

Systems Engineering Management Processes, Cont.

Systems Engineering Volume II, Management Process Table of Contents:

1. Technical Planning
2. Interface Management
3. Technical Assessment
4. Decision Analysis
5. Requirements Management
6. Risk Management
7. Configuration Management
8. Technical Data Management



Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

1. Technical Planning
2. Interface Management
3. Technical Assessment
4. Decision Analysis
5. Requirements Management
6. Risk Management
7. Configuration Management
8. Technical Data Management

Technical Planning

Addresses the scope of the technical effort required to develop the system. This is reflected in the systems engineering plan, a living document that evolves through the life cycle. LCLs should identify supportability issues that should be incorporated in this plan. Click here for a long description of the graphic below.

Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

1. Technical Planning
2. Interface Management
3. Technical Assessment
4. Decision Analysis
5. Requirements Management
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Long Description

Two green and white boxes - the top one labeled 'Decompose Concept Performance into Functional Definition & Verification Objectives.' A red arrow points from this box into the second one below it, which is labeled 'Decompose Concept Functional Definition into Concept Components & Assessment Objectives.'

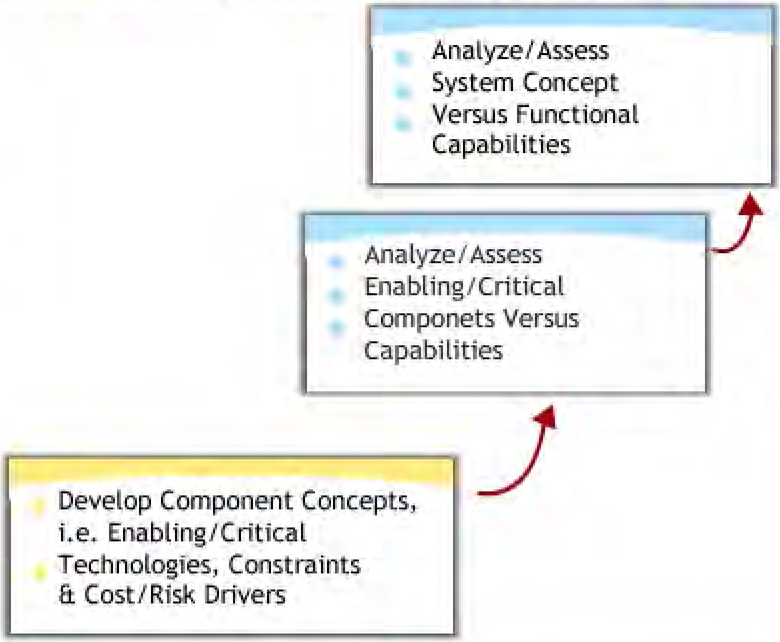
Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

1. Technical Planning
2. Interface Management
3. Technical Assessment
4. Decision Analysis
5. Requirements Management
6. Risk Management
7. Configuration Management
8. Technical Data Management

Interface Management

Ensures interface definition and compliance among the elements that compose the system; as well as with other systems with which the system or system elements must interoperate. Interface management control measures ensure that all internal and external interface requirement changes are properly documented in accordance with the configuration management plan and communicated to all affected configuration items. Click here for a long description of the graphic below.



Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

1. Technical Planning
2. Interface Management
3. Technical Assessment
4. Decision Analysis
5. Requirements Management
6. Risk Management
7. Configuration Management
8. Technical Data Management

Interface Management

Ensures interface definition and compliance among the elements that compose the system; as well as with other systems with whic
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Long Description

Three boxes lined up vertically to represent Interface Management. The bottom box is yellow and white and reads:

- Develop Component Concepts, i.e. Enabling/Critical
- Technologies, Constraints & Costs/Risk Drivers

A red arrow goes from this box up to the middle blue and white box, which reads:

- Analyze/Assess
- Enabling/Critical
- Components versus Capabilities

A red arrow points from this middle box to the top one, also blue and white, which reads:

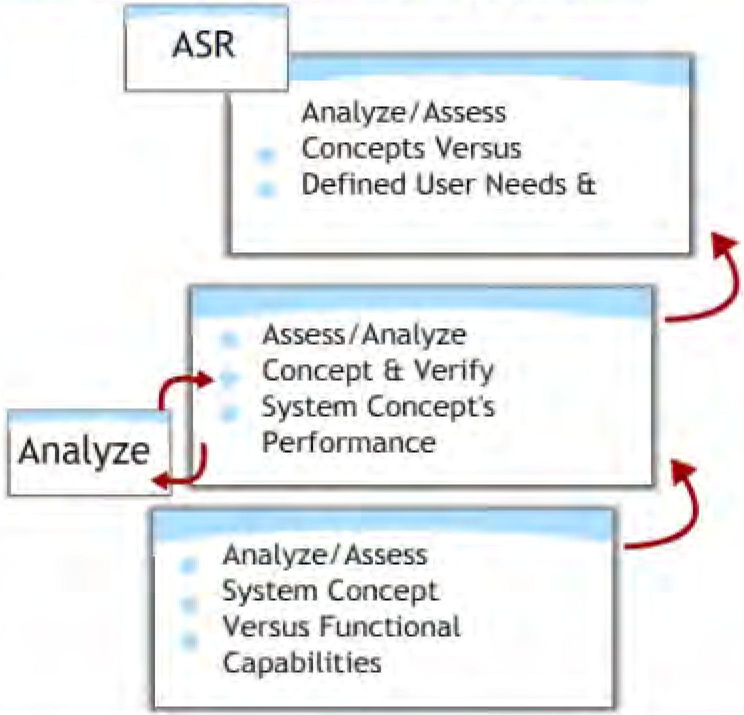
- Analyze/Assess
- System Concept
- Versus Functional Capabilities

Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

Technical Assessment

Measure technical progress and the effectiveness of plans and requirements. This includes activities associated with Technical Performance Measurement and the conduct of technical reviews. LCLs should be active participants in the technical reviews and assist in identifying support characteristics to be subject to Technical Performance Measurement.
Click here for a long description of the graphic below.



Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

Technical Assessment

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Long Description

Three blue and white boxes lined up vertically to represent Technical Assessment. The bottom box reads:

- Analyze/Assess
- System Concept
- Versus Functional Capabilities

A red arrow goes from this box up to the middle one, which reads:

- Assess/Analyze
- Concept & Verify
- System Concept's Performance

To the left of this box is a smaller one, labeled 'Analyze.' A red arrow goes from the middle box to the smaller one, and another arrow goes from the smaller one back into the middle. A red arrow points from the middle box to the top one, which reads:

- Analyze/Assess
- Concepts Versus
- Defined User Needs

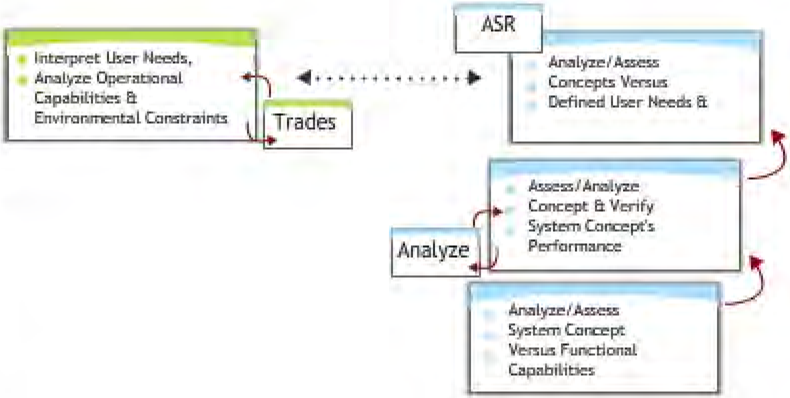
Above this box, and to the left, is a smaller box labeled 'ASR.'

Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

Decision Analysis

Provides the basis for evaluating capabilities to include trade studies, models and simulation, supportability analysis, level of repair analysis, post fielding support analysis, repair versus discard, and cost analysis.
Click here for a long description of the graphic below.



Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

Decision Analysis

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Long Description

In this flowchart, a green white box is on the left, and contains:

- Interpret User Needs
- Analyze Operational Capabilities & Environmental Constraints

To the right of this is a smaller box labeled 'Trades.' Red arrows point from the first box into 'Trades' and back out.
A dotted, two-ended arrow, points from this box to a tiered stack of blue and white boxes at the right. At the top is a small box labeled 'ASR.' This sits atop a box with:

- Analyze/Assess
- Concepts Versus
- Defined User Needs

A box sits below this, and reads:

- Assess/Analyze
- Concept & Verify

Systems Engineering Management Proces

Systems Engineering Volume II, Managen
Process Table of Contents:

1. Technical Planning
2. Interface Management
3. Technical Assessment
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8. Technical Data Management

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Decision Analysis

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- System Concept
- Versus Functional Capabilities

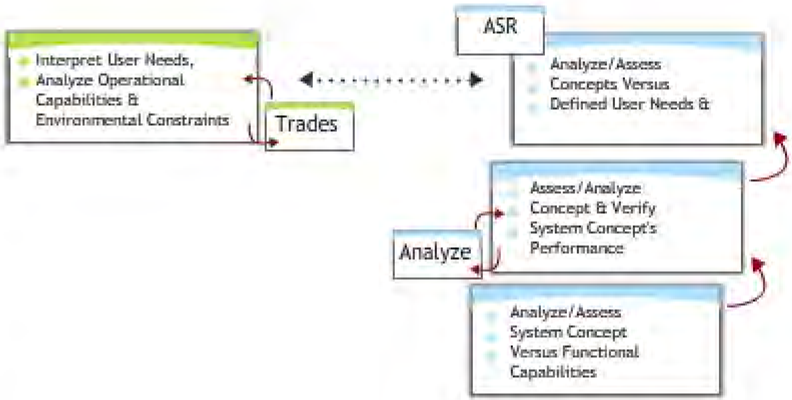
A red arrow points from this box to the middle one.

Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

Requirements Management

Maintains the traceability of all requirements from capabilities needs, documents all changes to those requirements and records the rationale for those changes. Supportability requirements are an integral element of this process.
Click here for a long description of the graphic below.



Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

Requirements Management

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Systems Engineering Management Proces

Systems Engineering Volume II, Managen
Process Table of Contents:

Requirements Management

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Systems Engineering Management Process

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1. Technical Planning
2. Interface Management
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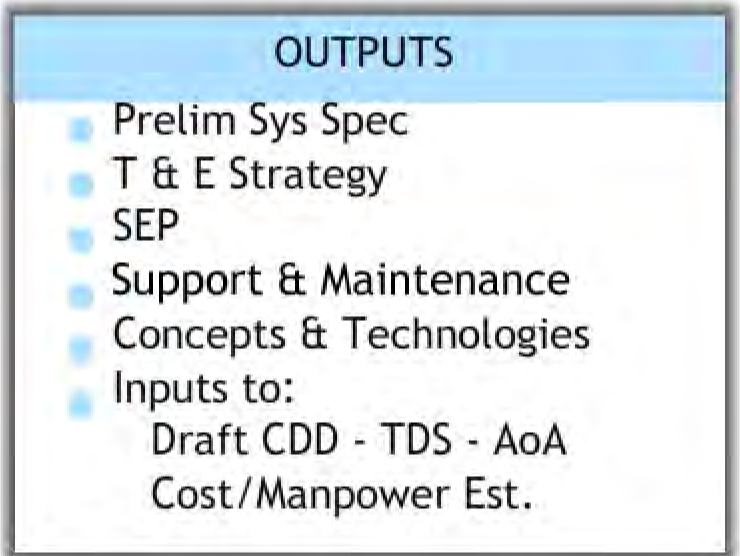
7. Configuration Management
8. Technical Data Management

Risk Management

Addresses risk planning, assessment, handling and mitigation strategies and monitoring approaches. The LCL can utilize this process to manage risk for supportability issues such as meeting logistics footprint requirements.
Click here for a long description of the graphic below.



Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

Risk Management

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Click h

Long Description

The outputs of Risk Management are:

- Prelim Sys Spec
- T&E Strategy
- SEP
- Support and Maintenance
- Concepts and Technologies
- Inputs to:
  - Draft CDD - TDS - AoA
  - Cost/Manpower Est.

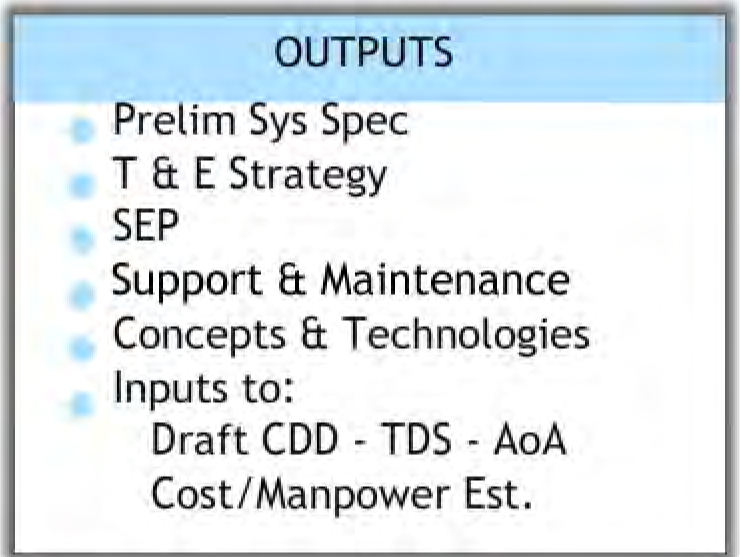
Inputs to:
Draft CDD - TDS - AoA
Cost/Manpower Est.

Systems Engineering Management Process

Systems Engineering Volume II, Managem
Process Table of Contents:

Configuration Management

Is the application of sound business practices to establish and maintain consistency of a product's attributes with its requirements and product configuration information. This process is a critical one for the entire life cycle of the system and is of special interest to logisticians. The supportability process of serialized item management can be incorporated here.
Click here for a long description of the graphic below.



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Click here for a long description of the graphic below.

Long Description

The outputs of Configuration Management are:

- Prelim Sys Spec
- T&E Strategy
- SEP
- Support and Maintenance
- Concepts and Technologies
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  - Draft CDD - TDS - AoA
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Cost/Manpower Est.

Systems Engineering Management Process

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1. Technical Planning
2. Interface Management
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4. Decision Analysis
5. Requirements Management
6. Risk Management
7. Configuration Management
8. Technical Data Management

Technical Data Management

Includes the management of all information for or associated with product development and sustainment, including the data associated with system development; modeling and simulation used in development or test, test and evaluation, installation; parts; spares; repairs; usage data required for product sustainment; and source or supplier data. In the program office, data management consists of the disciplined processes and systems used to plan for, acquire access, manage, protect, and use data of a technical nature to support the total life cycle of the system under the Total Life Cycle Systems Management concept.

Knowledge Review

Assess/Analyze Enabling Critical Components Versus Capabilities is a characterisitic of which of the following:

- [ ] Technical Planning
- [x] Interface Management

Check Answer

Assess/Analyze Enabling Critical Components Versus Capabilities is a characterisitic of **Interface Management**.

Knowledge Review

Develop Component Concepts, i.e., Enabling/Critical Technologies, Constraints, and Cost/Risk Drivers is a characteristic of which of the following:

- [x] Design Solution
- [ ] Logical Analysis

Check Answer

Develop Component Concepts, i.e., Enabling/Critical Technologies, Constraints, and Cost/Risk Drivers is a characteristic of **Design Solution**.

Collaboration

While the LCL does not typically participate in every systems engineering activity, close collaboration and selective participation are essential. The systems engineering community serves as the integrator of requirements, assessments and recommendations. The input and analysis of the LCLs must be incorporated in the systems engineering analysis; and, the LCLs must be knowledgeable regarding trade-offs between cost, schedule, and technical and support performance.

Acquisition logistics ensures the development of supportable system designs and then supports the actual system, as designed and as it evolves, for its entire life cycle. This task is very dynamic and is most successful when done in close partnership with the systems engineering community. The ability to ensure affordable support is dependent upon:

- building in reliability and maintainability, and
- the necessary tools and information, such as prognostics and diagnostics and serialized item tracking, in the system design and procurement.

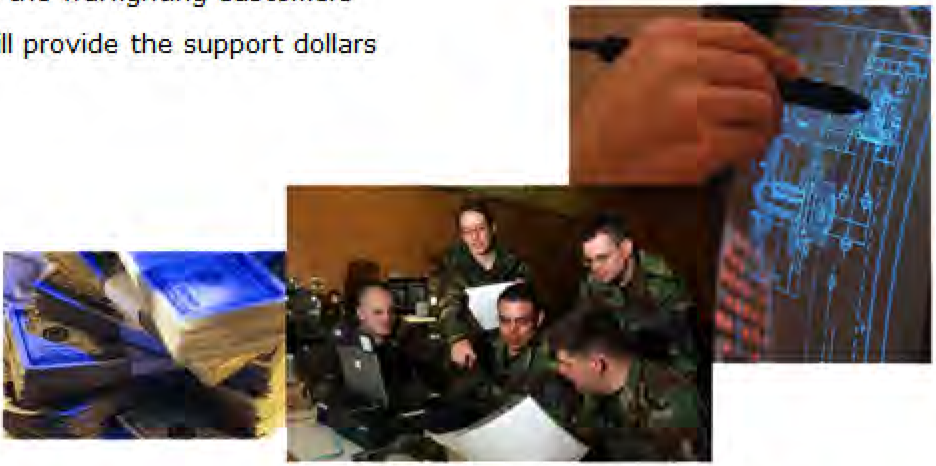
The ability to craft an effective product support strategy to support the system as delivered and as it evolves depends upon a comprehensive understanding of the risks and trade-offs that were made along the way, including the ground rules and assumptions.

Collaboration, Cont.

In the past, systems designers provided overly optimistic estimates of reliability and maintainability. As required, LCLs designed and developed product support packages based upon logistics requirements that resulted from those estimates. What happened when the system was fielded and required product support? More often than not, the support infrastructure proved inadequate to the task resulting in poor availability, poor reliability, and increased support costs and logistics footprint.

Active participation in the systems engineering process and an understanding of the basis and outputs of trade studies provide LCL with the necessary insights to critically evaluate support capabilities and to develop adequate product support strategies. These strategies will balance out the:

- risk of optimistic engineering estimates
- expectations of the warfighting customers
- budgets that will provide the support dollars



Joint Capability Technology Demonstrations (JCTDs)

JCTDs programs:

- Permit rapid technology capability demonstration and evaluation.
- Accelerate the development and employment of technology and innovative operational concepts by the military user.
- Exploit mature and maturing technologies to solve important military problems.
- Serve as a catalyst to rapidly transition new capabilities from the developer to the user and support the assessment of operational suitability in real-world conditions.

Key: The LCL should play a key role in evaluating the supportability of a planned JCTD initiative.

Joint Capability Technology Demonstrations (JCTDs)

JCTDs programs:

- Permi
- Acce pts by the m
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JCTDs

The mission of RF/JCTD is to find, demonstrate, transition, and transfer the best operational concepts and technology solutions for transformational, joint, and coalition warfare.

RF accelerates cutting-edge technologies to the Warfighter by:

- Speeding the discovery, development, and delivery of technology and concepts for sustained military capabilities with emphasis on capabilities that are innovative, transformational, and joint;
- Partnering with Services, Agencies, and Coalition elements to provide the best capabilities to Joint and Coalition warfighters;
- Seeking the very best technical and operational concept solutions from Defense, industry, and academic sources;
- Leveraging "try before you buy" demonstrations, exploiting "test to procure" initiatives, and forging partnerships to create new technology and operational concept solutions for warfighters; and
- Combining improved business processes to operationalize innovation faster than ever.

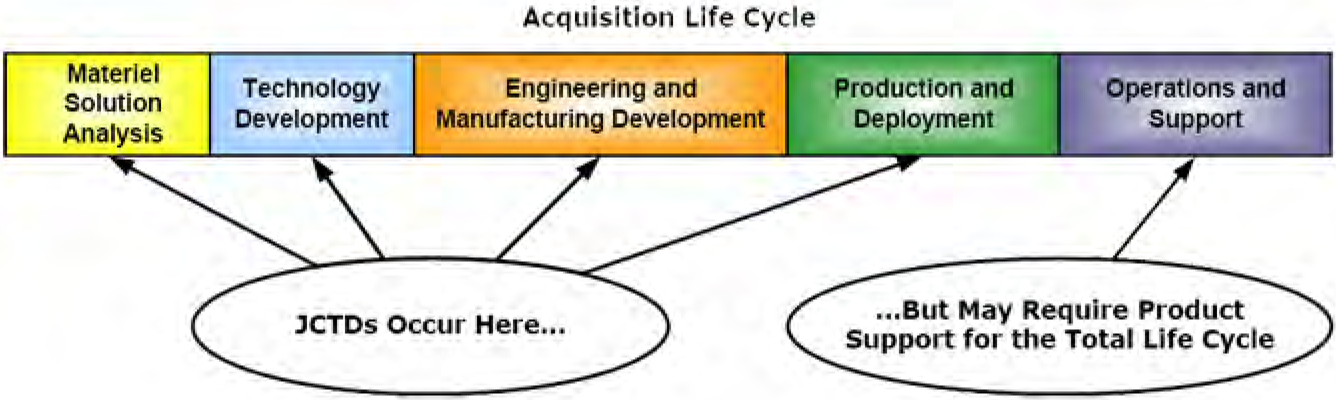
(From 'The RF/JCTD Mission' at http://www.acq.osd.mil/jctd/aboutus.html#mission)

Joint Capability Technology Demonstrations (JCTDs), Cont.

JCTDs give LCLs:

- The ability to identify and reduce operational risk early in the acquisition process.
- An approach for compressing acquisition cycle time—the time it takes to develop and field weapon systems.
- A mechanism for stimulating the innovations needed to accelerate logistics transformation.

Note: JCTDs may transition quickly to an operational environment, requiring long-term support capability



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Joint Capability Technology Demonstrations (JCTDs), Cont.

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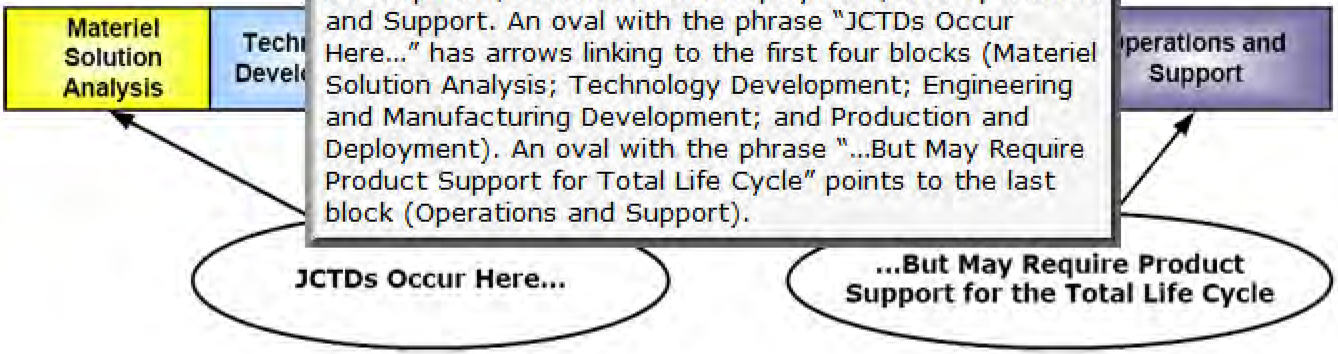
- An approach for compressing acquisition cycle time—the time it takes to develop and field weapon systems.
- A mechanism for stimulating the innovations needed to accelerate logistics transformation.

Note: JCTDs may transitio … support capability

Long Description

The Acquisition Life Cycle. Five end-to-end blocks, from left to right: Materiel Solution Analysis, Technology Development; Engineering and Manufacturing Development; Production and Deployment; and Operations and Support. An oval with the phrase "JCTDs Occur Here…" has arrows linking to the first four blocks (Materiel Solution Analysis; Technology Development; Engineering and Manufacturing Development; and Production and Deployment). An oval with the phrase "…But May Require Product Support for Total Life Cycle" points to the last block (Operations and Support).



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Challenges Associated with Transitioning an JCTD to a Formal Acquisition Program

Joint Capability Technology Demonstration Table of Contents:

1. Contracting Strategy
2. Interoperability
3. Supportability
4. Test and Evaluation
5. Affordability
6. Funding
7. Requirements
8. Developing

Challenges Associated with Transitioning a

Joint Capability Technology Demonstratio
Contents:

1. Contracting Strategy
2. Interoperability
3. Supportability
4. Test and Evaluation
5. Affordability
6. Funding
7. Requirements
8. Developing

Contracting Strategy

Motivating the contractors to provide best value (from an overall life cycle cost-effectiveness perspective).

Challenges Associated with Transitioning a

Joint Capability Technology Demonstratio
Contents:

1. Contracting Strategy
2. Interoperability
3. Supportability
4. Test and Evaluation
5. Affordability
6. Funding
7. Requirements
8. Developing

Interoperability

Ensuring that the JCTD can interface with other systems on the battlefield.

Challenges Associated with Transitioning a

Joint Capability Technology Demonstratio
Contents:

1. Contracting Strategy
2. Interoperability
3. Supportability
4. Test and Evaluation
5. Affordability
6. Funding
7. Requirements
8. Developing

Supportability

Ensuring that the fielded systems can be cost-effectively supported.

Challenges Associated with Transitioning a

Joint Capability Technology Demonstratio
Contents:

1. Contracting Strategy
2. Interoperability
3. Supportability
4. Test and Evaluation
5. Affordability
6. Funding
7. Requirements
8. Developing

Test and Evaluation

Early and continuous participation of the operational testing community and evaluators throughout the JCTD process from definition of data needs to completion of the Operational Assessment to support the production/transition decision.

Challenges Associated with Transitioning a

Joint Capability Technology Demonstratio
Contents:

1. Contracting Strategy
2. Interoperability
3. Supportability
4. Test and Evaluation
5. Affordability
6. Funding
7. Requirements
8. Developing

Affordability

Assessing life cycle affordability and application of a Cost As an Independent Variable (CAIV) strategy to continuously look for ways to reduce cost.

Challenges Associated with Transitioning a

Joint Capability Technology Demonstratio
Contents:

1. Contracting Strategy
2. Interoperability
3. Supportability
4. Test and Evaluation
5. Affordability
6. Funding
7. Requirements
8. Developing

Funding

Choosing the proper strategy for obtaining the resources necessary for acquisition.

Challenges Associated with Transitioning a

Joint Capability Technology Demonstratio
Contents:

1. Contracting Strategy
2. Interoperability
3. Supportability
4. Test and Evaluation
5. Affordability
6. Funding
7. Requirements
8. Developing

Requirements

Evolving from a mission need and associated performance goals at the start of the JCTD to a formal ICD and/or a system performance specification at the conclusion of the JCTD which captures the technology maturity and the knowledge and understanding gained by the warfighter while using the capability in realistic military exercises.

Challenges Associated with Transitioning a

Joint Capability Technology Demonstratio
Contents:

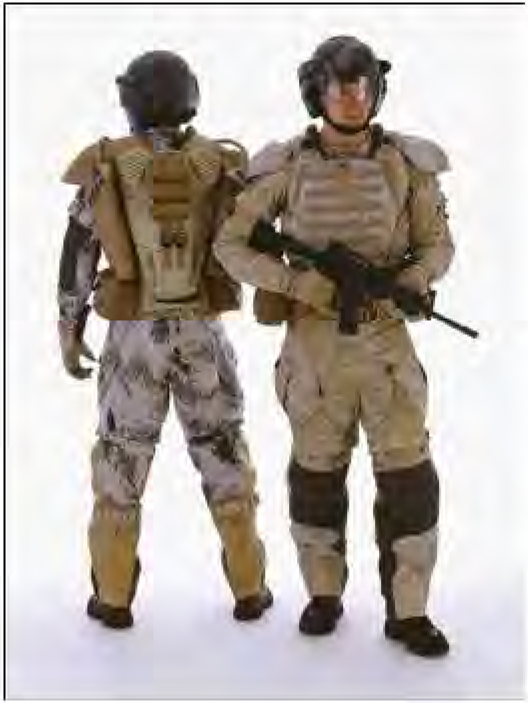
1. Contracting Strategy
2. Interoperability
3. Supportability
4. Test and Evaluation
5. Affordability
6. Funding
7. Requirements
8. Developing

Developing

The required documentation supporting the acquisition decision that occurs at the end of the JCTD.

The LCL's Role in JCTD Management

The JCTD process is a valuable tool to get new capabilities to the warfighter as quickly as possible. It includes an evaluation of overall systems suitability including support. It is not just consideration of operational effectiveness in the traditional sense but may require a change in the current operational and support approach. Logistics planning must be started early and be viewed as an operational requirement and not a follow-on task.



The LCL's Role in JCTD Management, Cont.

During the planning for the JCTD, support from knowledgeable LCLs should identify how, and to what extent, long-term support considerations should be addressed in the program. Planning should include:

- Support considerations that need to be addressed in the development and evaluation of design and operating concepts
- Categories of support that must be addressed and an initial supportability strategy for each of the categories
- A supportability strategy reflected in the JCTD Management Plan, including logistics factors that impact the design of the system (e.g. reliability, availability, built-in diagnostics, maintenance capability)
- Credibly documented life cycle support costs
- Documented and developed support training programs
- An adequate definition of support requirements so that support elements are procured concurrently with end items
- Ongoing examination of ways to reduce costs

Knowledge Review

Motivating the contractors to provide a best value (from an overall life cycle cost-effectiveness perspective) is a definition of which of the following?

- [x] Contracting Strategy
- [ ] Interoperability

Check Answer

Motivating the contractors to provide a best value (from an overall life cycle cost-effectiveness perspective) is a definition of **Contracting Strategy**.

Knowledge Review

Early and continuous participation of the operational testing community and evaluators throughout the ACTC process describes which of the following:

- [ ] Supportability
- [x] Test and Evaluation
- [ ] Developing
- [ ] Requirements

Check Answer

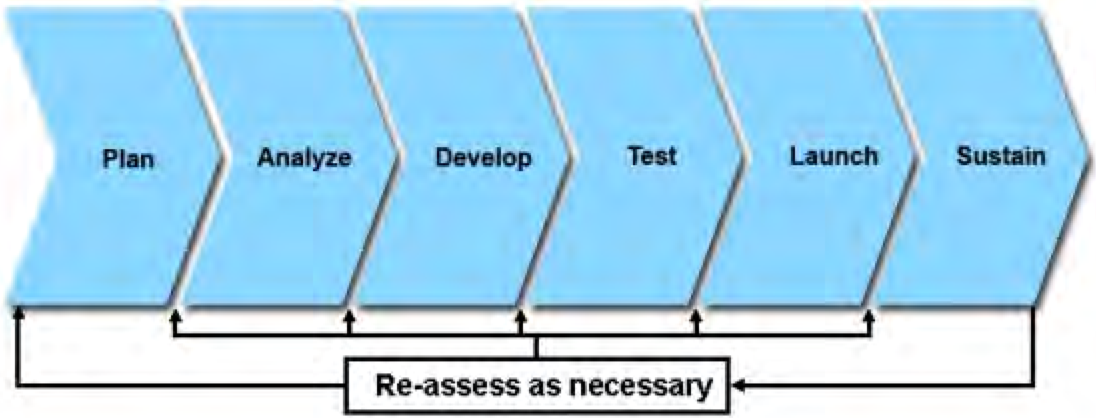
Early and continuous participation of the operational testing community and evaluators throughout the ACTC process describes **Test and Evaluation**.

The LCL's Strategy in Technology Implementation

In effectively managing an JCTD, the LCL must take a key role in assessing the life cycle applicability of new technologies as part of a planned weapon system or equipment acquisition.

A successful technology project, including JCTDs, can only be the result of solid management, committed team members, and a clearly defined implementation approach. This approach aligns projects with established goals and objectives, defines the project's critical path, involves the proper individuals, and ensures milestones and deliverables are met on time and within budget.

To help ensure successful evaluation and implementation of technology adoption and insertion efforts and long-term supportability, the following steps are suggested:



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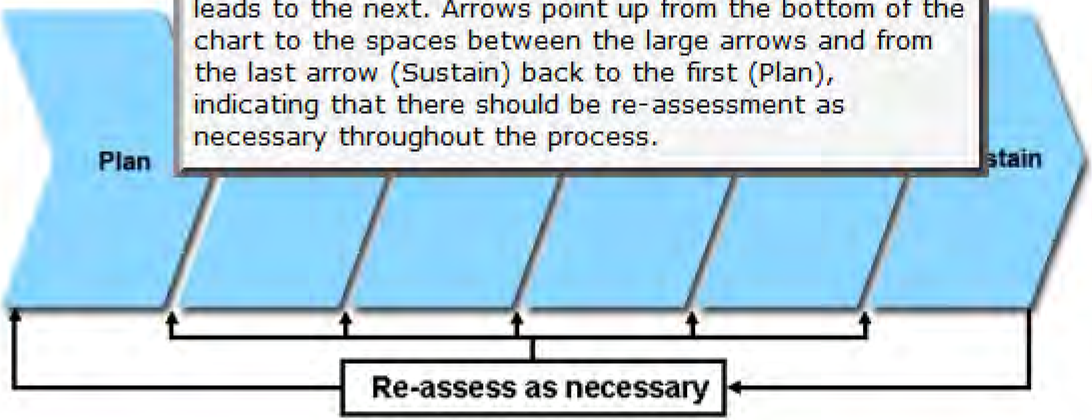
To help ensure successfu nsertion efforts and long-term supportability,

Long Description

Six large integrated arrows, from left to right: Plan, Analyze, Develop, Test, Launch, and Sustain. One step leads to the next. Arrows point up from the bottom of the chart to the spaces between the large arrows and from the last arrow (Sustain) back to the first (Plan), indicating that there should be re-assessment as necessary throughout the process.



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Open Systems and Interoperability

"In light of asymmetrical and evolving threats and rapidly changing technologies, the DoD can no longer afford long development cycle time and high cost of ownership of systems that are acquired as an end to themselves. The age of acquiring and developing stove-piped systems is over and the indications point to a paradigm shift characterized by joint integrated warfare which is enabled by net-centric, integrated, and open architectures." Source

The defense capabilities that are essential to military operations must be readily adaptable to changes in threats, technologies and operations and must be interoperable within the joint warfighting environment. Systems engineering processes must ensure that the systems developed to meet capability requirements are based on open systems and are interoperable. The LCL plays a key role in these processes through IPTs.

Select each of the three key concepts below for a brief description:

- Open Systems
- Open Standards
- Interoperability

Open Systems and Interoperability

"In light of asymmetrical and evolving threats and rapidly changing technologies, the DoD can no longer afford long development cycle time and high cost of ownership of systems that are acquired as an end to themselves. The age of acquiring and developing stove-piped systems is over and the indications point to a paradigm shift characterized by joint integrated warfare which is enabled by net-centric, integrated, and open architectures." Source

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OPEN SYSTEMS POLICIES AND ENFORCEMENT CHALLENGES, COL KENNETH FLOWERS and CYRUS AZANI, Presented and Published in the Proceedings of the National Defense Industrial Association Systems Engineering Conference, October 25-28, 2004 Dallas, Texas.

Select each of the three ke

- Open Systems
- Open Standards
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Open Systems and Interoperability

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Open Systems

An open system is one that employs modular design, uses widely supported and consensus based standards for its key interfaces, and has been subjected to successful validation and verification tests to ensure the openness of its key interfaces.

Select each of the three key concepts below for a brief description:

- Open Systems
- Open Standards
- Interoperability

Open Systems and Interoperability

"In light of asymmetrical and evolving threats and rapidly changing technologies, the DoD can no longer afford long development cycle time and high cost of ownership of systems that are acquired as an end to themselves. The age of acquiring and developing stove-piped systems is over and the indications point to a paradigm shift characterized by joint integrated warfare which is enabled by net-centric, integrated, and

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Open Standards

Open standards are standards that are widely used, consensus based, published and maintained by recognized industry standards organizations.

Select each of the three key concepts below for a brief description:

- Open Systems
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Open Systems and Interoperability

"In light of asymmetrical and evolving threats and rapidly changing technologies, the DoD can no longer afford long development cycle time and high cost of ownership of systems that are acquired as an end to themselves. The age of acquiring and developing stove-piped systems is over and the indications point to a paradigm shift characterized by joint integrated warfare which is enabled by net-centric, integrated, a

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Select each of the th

Open Systems

Open Standards

Interoperability

Interoperability

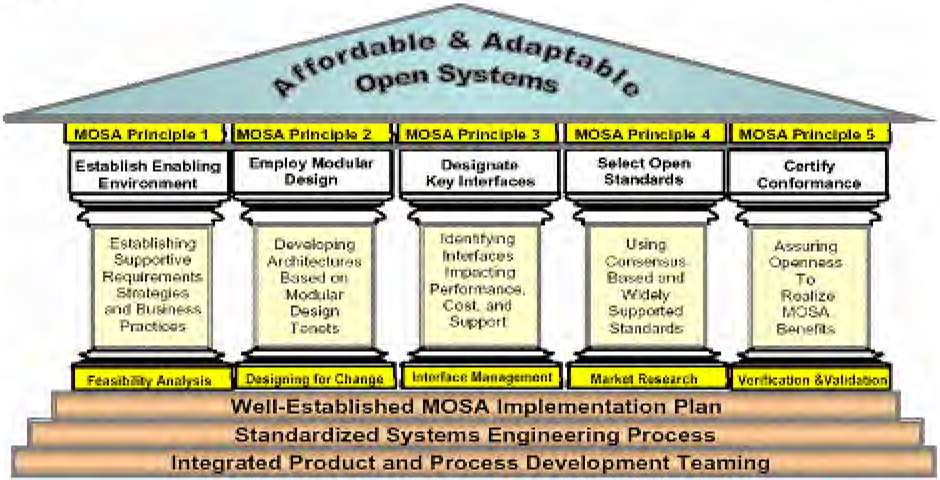
The ability of systems, units or forces to provide data, information, material and services to and accept the same from other systems, units or forces and to use the data, information, material and services so exchanged to enable them to operate effectively together. Information technology and National Security Systems Interoperability includes both the technical exchange of information and the end-to-end operational effectiveness of that exchanged information as required for mission accomplishment.

Modular Open Systems Approach (MOSA)

DoD guidance has identified a key enabler for effective implementation of joint architectures and evolutionary acquisitions. This enabler is a Modular Open Systems Approach (MOSA) – an integrated business and technical strategy that employs a modular design and, where appropriate, defines key interfaces using widely supported, consensus-based standards that are published and maintained by a recognized industry standards organization.

The MOSA framework is based on five key principles. The LCL needs to:

- Understand these principles
- Support their implementation
- Understand the implications of MOSA to the design of effective product support



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Modular Open Systems Approach (MOSA)

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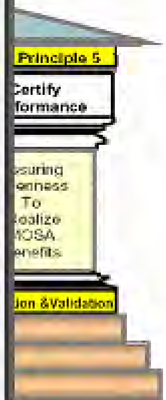
Long Description

The Modular Open Systems Approach: The Fundamental Building Block of Joint Integrated Warfare Systems. This picture shows three steps leading to five pillars and capped with a triangular roof. The three steps are, from bottom to top: Integrated Product and Process Development Teaming, Standardized Systems Engineering Process; and Well-Established MOSA Implementation Plan.

The left-most pillar represents MOSA Principle 1: Establish Enabling Environment. The principle is based in Feasibility Analysis and involves establishing supportive requirements, strategies, and business practices. The next pillar to the right represents MOSA Principle 2: Employ Modular Design. The principle is based in Designing for Change and involves developing architectures based on modular design tenets. The next pillar to the right represents MOSA Principle 3: Designate Key Interfaces. The principle is based in Interface Management and involves identifying interfaces impacting performance, cost, and support. The next pillar to the right represents MOSA Principle 4: Select Open Standards. The principle is based in Market Research and involves using consensus based and widely supported standards. The right-most pillar represents MOSA Principle 5: Certify Conformance. The principle is based in Verification & Validation and involves assuring openness to realize MOSA benefits. The triangular roof capping the pillars has the intended results of the MOSA framework: Affordable & Adaptable Open Systems.



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MOSA, Cont.

MOSA enables the acquisition team to:

1. Design for affordable change by basing design strategies on widely supported open standards.
2. Employ evolutionary acquisition and spiral development by employing a modular design.
3. Develop an integrated roadmap for weapon system design and development to ensure that the weapon system delivered is upgradeable, affordable, and supportable throughout its planned life-cycle.

MOSA facilitates:

- reduced acquisition cycle time and overall life-cycle cost;
- the ability to insert cutting edge technology as it evolves;
- commonality and reuse of components among systems;
- and an increased ability to leverage commercial investment.

MOSA capitalizes on best engineering and business practices to leverage the investments made by the private sector in commercial products, practices, and technologies in order to field superior warfighting capability more quickly and more affordably.

Click here to read more on MOSA.

MOSA, Cont.

MOSA enables the acquisition team to:

1. Design for affordable change by basing design strategies on widely supported open standards.
2. Employ evolutionary acquisition and spiral development by employing a modular design.
3. Develop an integ nsure that the weapon system its planned life-cycle.

MOSA facilitates:

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- the ability to ins
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MOSA - Read More

The commercial sector innovations and new technology investments are most effectively leveraged when programs or projects (1) choose commercially supported specifications and standards for selected system interfaces (external, internal, functional, and physical), products, practices, and tools, and (2) build systems based on modular hardware and software design tenets. For example, a support application of open systems could be the ability of components to be compatible with standard interface protocols to facilitate rapid repair and component enhancement/ upgrade through 'black box' technology using common interfaces. Physical interfaces can be designed such that mating between components can only happen correctly.

MOSA capitalizes on be nts made by the private sector in comm erior warfighting capability more quickly and more affordably.

Click here to read more on MOSA.

The Five Principles of MOSA

Modular Open Systems Approach Table of Contents:

1. Principle 1
2. Principle 2
3. Principle 3
4. Principle 4
5. Principle 5

Modular Open System Approach

The Five Principles of MOSA

Modular Open Systems Approach Table o

1. Principle 1
2. Principle 2
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5. Principle 5

Principle 1

As soon as the feasibility of an open systems design strategy is proven, the programs must establish enabling business and engineering practices to ensure successful development and implementation of an open architecture for the system. The alternatives for product support are much more flexible for a system based on an open system design. The feasibility of pursuing support strategies on availability and usage versus repairs increases if the design, based on open standards, requires delivery of an output capability, not defense-specified and unique, hardware and software.

The Five Principles of MOSA

Modular Open Systems Approach Table o

1. Principle 1
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Principle 2

Modular design is a design where functionality is partitioned into discrete, cohesive, and self-contained units with well-defined interfaces that permit substitution of such units with similar components or products from alternate sources with minimum impact on existing units. A key cost driver for life cycle support is often diminishing manufacturing sources (DMS) or obsolescence. A modular design enables the insertion of new technology that meets the performance requirements and not only reduces cost, but could also improve capability.

The Five Principles of MOSA

Modular Open Systems Approach Table o

1. Principle 1
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Principle 3

To effectively manage and control interfaces, programs need to group interfaces into key and non-key interfaces. Key interfaces should be identified and put under control early in the system acquisition life cycle. Key interfaces are defined as common boundaries shared between system modules that provide access to critical data, information, material, or services, or are of high interest due to rapid technological change, a high rate of failure, or costliness of connected modules. The LCL can gain insights to key risk areas for product support and design business and technical strategies to mitigate this risk.

The Five Principles of MOSA

Modular Open Systems Approach Table o

1. Principle 1
2. Principle 2
3. Principle 3
4. Principle 4
5. Principle 5

Principle 4

Programs should establish an on-going market research and analysis activity to identify and track technology and market trends for open (widely supported and consensus-based) interface standards and specific commercial and/ or non-developmental products (hardware and software, tools and models) that are compliant with such standards for possible use in the system. The LCL could identify and assess the potential use of open standards for system diagnostics, prognostics and test and support equipment.

The Five Principles of MOSA

Modular Open Systems Approach Table o

1. Principle 1
2. Principle 2
3. Principle 3
4. Principle 4
5. Principle 5

Principle 5

Programs should devise testing plans to ensure conformance of selected commercial items and non-developmental items to appropriate interface definitions especially open standards. They also need to plan for compatibility testing to ensure that system modules interface and function together properly. The LCL needs to actively participate in developing the testing plans to ensure that requirements for joint logistics interoperability can be met.

Knowledge Review

Which of the following best describes MOSA Principle 1?

- [ ] Employ modular design tenets.
- [ ] Use open standards.
- [ ] Designate key interfaces.
- [x] Establish an enabling environment.

Check Answer

Principle 1 of MOSA involves **establishing an enabling environment**.

Open Systems-Based Acquisition Strategy

An open systems-based acquisition strategy should:

- Address how a program intends to capitalize on MOSA principles
- Determine how the program should be divided into technology spirals and development increments and how early increments will be integrated or retrofitted with subsequent increments in the most cost effective manner
- Integrate a system with other systems in a joint integrated architecture venue
- Achieve net-centricity and interoperability
- Take advantage of commercial items (state of the art/ practice, high reliability, multiple suppliers)
- Gain access to the latest technologies from competitive sources of supply throughout the system life cycle to ensure capability for subsequent technology insertion
- Control total ownership cost and reduce the development cycle time
- Manage technology cycling and parts obsolescence

Click here to view Open Systems Joint Task Force's Program Manager's Guide - A Modular Open Systems Approach (MOSA) to Acquisition.

Open Systems-Based Acquisition Strategy, Cont.

The LCL provides key insights, analysis and recommendations in the MOSA process for the trade-offs between development cycle time, technology risk, procurement cost, product support options and life cycle cost. For example, the technical performance of sub-systems or components based on open standards may be identical, but the support requirements may differ. These differences must be identified and reflected in life cycle cost estimates and product support plans.

The long-term benefits of MOSA can be significant if commercial technologies and products can be used to meet evolving defense requirements. By incorporating a modular open design, technology refreshment is simplified from complex retrofit programs to remove and replace actions. This not only reduces cost, but also time. This approach also adds another very dynamic dimension to life cycle logistics. The support planning process must be aligned with technology cycles and to the degree that they impact time, testing cycles.

Click here to read a Naval Postgraduate School (NPS) report – Using a MOSA Approach in Defense Acquisitions.

Interoperability of Logistics Information

Another aspect of interoperability that is important for life cycle logistics is the interoperability of logistics information at the system level with the military service and/or DoD joint logistics information systems that provide logistics Command and Control (C2) for the joint commanders.

As product support capabilities are evaluated, the ability to establish interoperability between the system level logistics information system and the service and/or DoD logistics systems is critical. This entails not only the interoperability of the information systems, but also the data themselves. As the Director for Logistics on the Joint Staff stated, "Standard enterprise data architecture is the foundation for effective and rapid data transfer and forms the fundamental building block to enable a common logistical picture and high logistical situational understanding, which in turn fosters warfighter confidence." Source

Click here to view an NPS research report, "Developing Software Requirements Supporting Open Architecture Performance Goals in Critical DoD System-of-Systems."

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Source

Quote Source: Joint Logistics: Shaping Our Future, Lt. Gen. C. V. Christianson, USA, Defense AT&L: July -August 2006

Click here to view an NPS research report, "Developing Software Requirements Supporting Open Architecture Performance Goals in Critical DoD System-of-Systems."

Technical Activities Summary

You have completed Technical Activities and should now be able to:

- Identify the LCL's role in systems engineering.
- Recognize the two components of system engineering processes and the role the LCL plays in each.
- Identify the LCL's role in JCTD Management.
- Define open systems, open standards and interoperability.
- Recognize the five principles of Modular Open Systems Approach (MOSA).
- Identify the benefits of MOSA to supportability.

Lesson Completion

You have completed the content for this lesson.

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